CORRES CONTROL **OUTGOING LTR#**

DOE ORDER #

05-RF-009	937	
DIST	LTR I	ENC
CROCKETT, G		
FERRERA, D.W.		<u> </u>
GILPIN, H.E.		COMPANY
LONG, J.W.		
LINDSAY, D. C.		— O-4-b 10, 000F
SHELTON, D.C.		October 10, 2005
TUOR, N.R.		
SNYDER, D		
PLAPPERT, R. D.		<u> </u>
GILLESPIE, D. R.		
NESTA, S.		<u>. </u>
WIEMELT, K	х	-X Mr. John J. Rampe
PRIMROSE, A	х	X Dusingt Management Division
		Project Management Division
		DOE, RFPO
		<u> </u>
		- Mr. Carl Carona
		Mr. Carl Spreng
		Colorado Department of Public Health and Environment
		— 4300 Cherry Creek Drive South
		Denver, CO 80246-1502
		— Mr. Mark Aguilar
	\blacksquare	U.S. Environmental Protection Agency
		999 18 th Street, Suite 300
		— Denver, CO 80202-2466
		TRANSMITTAL OF THE WHITE PAPER RESULTS OF (
		MEASURE/INTERIM REMEDIAL ACTION 903 PAD V
		NVESTIGATION – KLW-059-05
		,
CORRES.CONTROL	Х	$\frac{x}{x}$ Enclosed are copies of the transmittal of the white paper
PATS	Щ	
ADMN. RECORD	Х	\overline{x} measure/interim remedial action – 903 Pad volatile organ
WASTE REC CTR	٠ .	

SULTS OF GROUNDWATER INTERIM 903 PAD VOLATILE ORGANIC COMPOUND

white paper results of groundwater interim platile organic compound investigation.

If you have any question, please contact Annette Primrose at 303-994-2761.

UNCLASSIFIED CONFIDENTIAL **AUTHORIZED CLASSIFIER** Karen L. Wiemelt

SIGNATURE:

CLASSIFICATION

TRAFFIC

SECRET

Exemption - CEX-105-01 ER Program Manager

Date: Remediation, Industrial D&D, and Site Services

IN REPLY TO RFP CC #:

ALP:rlm

ACTION ITEM STATUS:

Enclosure:

PARTIAL/OPEN CLOSED

As Stated

LTR APPROVALS:

Original and 1 cc - Mr. John J. Rampe

(Last Name)

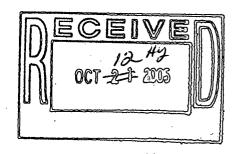
(Last Name) ORIG. & TYPIST INITIALS:

Norma Castaneda

SMN:rlm Letter # KLW-059-05

Kaiser-Hill Company, L L C

Rocky Flats Environmental Technology Site, 10808 Hwy. 93 Unit B, Golden CO 80403-8200





ADMIN RECORD

05-RF-00937

White Paper Results of Groundwater IM/IRA - 903 Pad VOC Investigation

In March 2005, soil sampling was conducted in the 903 Pad area (Individual Hazardous Substance Site 112) at Rocky Flats Environmental Technology Site (RFETS) near Golden, Colorado. This sampling was performed in support of the Sitewide Groundwater Interim Measure/Interim Remedial Action (Groundwater IM/IRA) Decision Document (Department of Energy [DOE] 2005a) to identify the location and size of any remaining significant volatile organic compound (VOC) source areas, if present, underlying the 903 Pad area. The project also better defined the bedrock surface in this area.

Background

The 903 Pad area was used to store drums that contained radioactively contaminated oils (primarily plutonium and americium) and VOCs from 1958 to 1967. The liquid in the drums was primarily lathe coolant and/or carbon tetrachloride. However, hydraulic oils, vacuum pump oils, trichloroethene, tetrachloroethene, silicone oils, acetone still bottoms, and other liquids were also stored in these drums. When leaking drums were noted in 1964, the contents of the leaking drums were transferred to new drums. The drums were removed from the area. Cleanup efforts began in 1967 and consisted of removal of some contaminated surface soils, covering the area with clean soil and installing an approximately 6-8 inch asphalt pad covering the entire 3.4 acre area (DOE 2000). The 903 Lip area is an area of surface contamination that was caused by high winds and rain that spread radiologically contaminated soils from the 903 Pad.

An accelerated action to remove radiologically contaminated soils at the 903 Pad, including asphalt and fill material from past cleanup actions, was completed in 2003. 20,213 cubic yards of radiologically contaminated soil was removed from the 903 Pad area including 12,909 cubic yards of mixed radiological and VOC-contaminated soil. The soil removal depths generally ranged from 1 to 4 feet below the surface for the 903 Pad, though some areas were excavated 4 to 6 feet deep (Figure 1). An accelerated action to remove radiologically contaminated soils the 903 Pad Lip Area was completed in 2004 with removal of 49,800 cubic yards of contaminated soil including 550 cubic yards of mixed radiological and VOC-contaminated soil.

While near surface VOC contaminated soils were removed as part of the accelerated action, actions to address deeper VOC contaminated soils, with the potential to contribute to groundwater contamination in and near this area, was deferred to the Groundwater IM/IRA.

The 903 Pad area presently consists of artificial fill and Rocky Flats Alluvium underlain by the Arapahoe formation. Artificial fill was used to backfill the excavations after the soil removal accelerated action and can be greater than four feet thick in some areas. Under the fill material is the Rocky Flats Alluvium, which is about 15 to 25 feet thick in the area of the 903 Pad and composed of poorly stratified and poorly sorted gravel (Knepper, 2005). Underlying that is the Arapahoe Formation composed of claystone and silty claystone with some lenticular sandstones (EG&G, 1995). Shallow groundwater in this area occurs primarily in the Rocky Flats Alluvium, subcropping lenticular sandstones (Arapahoe No. 1 Sandstone) and the weathered claystone. The average depth to water beneath the 903 Pad is approximately 19 feet but can vary from 7 to 22 feet deep.

Investigation Approach

Five areas where VOC-contaminated soils were potentially present at depth were identified using historical borehole and soil gas data (Figure 2). In addition, the VOC data collected for the soil removed and disposed of as waste during the accelerated action was utilized to indicate areas where VOC contamination concentrations in soil were previously high. For example, soil with tetrachloroethene concentrations over 100,000 micrograms/kilogram (ug/kg) was removed during the remedial action. In this area, higher concentrations of VOCs potentially may be present in the soil or dense non-aqueous phase liquids (DNAPLs) may have migrated downward and be present at depth.

The investigation was conducted as described in the Sampling and Analysis Plan Addendum developed for the 903 Pad VOCs (DOE 2005b). Twenty-five locations were sampled to bedrock within the five areas with the highest potential for residual VOCs (Figure 1). Figure 2 shows the target areas as well as the previous subsurface sample results.

Seventeen locations were drilled to bedrock with the Geoprobe[®]. The other eight were drilled with a dual-wall, reverse-circulation percussion drill rig. All boreholes were logged and the logs are included in Appendix A.

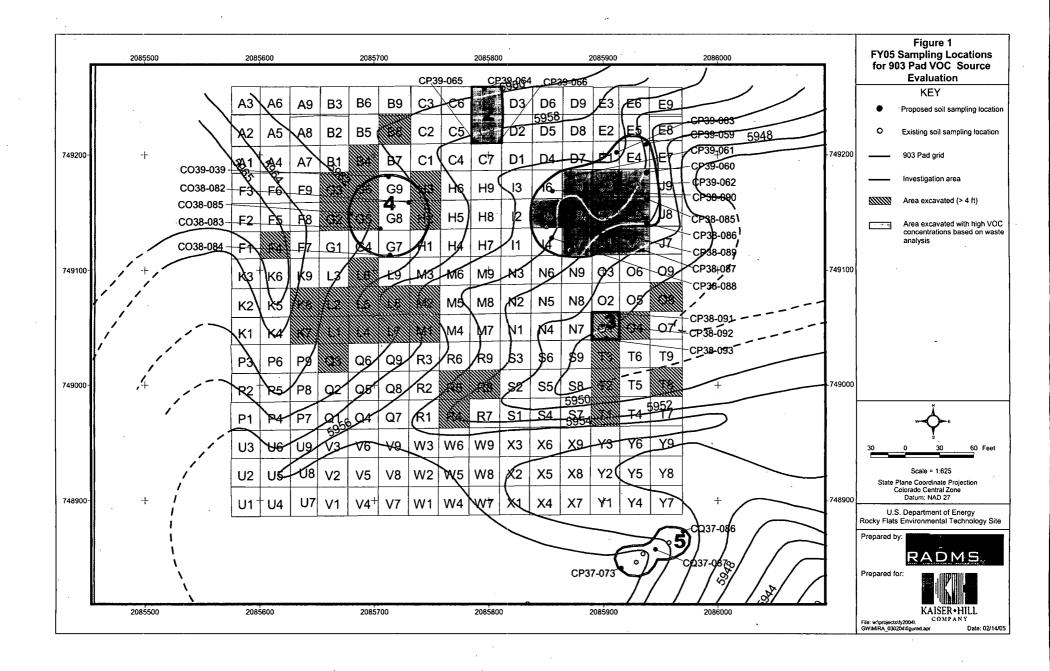
Samples were collected and analyzed from all intervals between the bottom of the fill from the previous soil removal to six feet below surface. The upper sampling intervals are generally between 4 feet (bottom of the fill) to 10 feet deep (6 feet below the fill) in accordance to the Sampling and Analysis Plan (DOE 2005b). Intervals from 6 ft to bedrock were cored and visually inspected for staining or other signs of contamination and screened with a photo-ionization detector (PID). VOC samples were collected and analyzed from core intervals where there were stained soils or elevated PID readings. In addition, VOC samples were collected immediately above and immediately below the bedrock surface. A total of 124 samples were collected and analyzed using Environmental Protection Agency Method 8260.

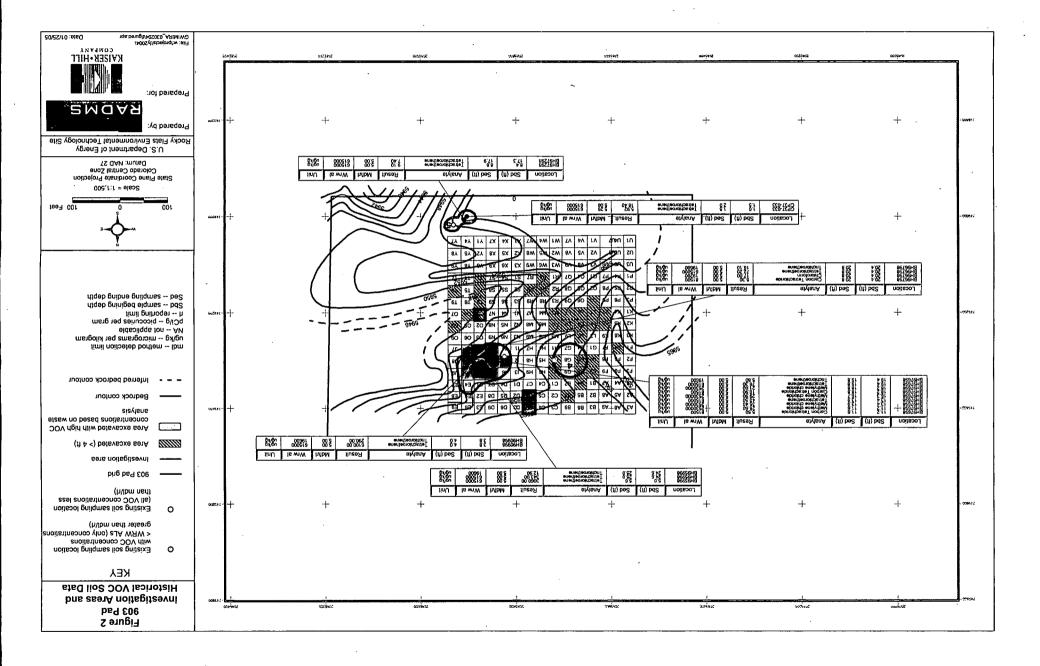
Geologic Setting

The investigation results were consistent with past investigations. In the 903 Pad area, fill material was generally three to four feet thick. In the 903 Lip Area (Area 5), fill material was approximately one foot thick. Alluvium and some colluvium were encountered beneath the fill material and ranged from 11 to 23 feet thick. The alluvium consisted of clayey gravel with varying amounts of sand. Clay was more predominant in some areas, particularly in the northern part of Area 1 where gravelly and sandy clays are 11 to 14 feet below the surface.

The top of bedrock was encountered at depths ranging from 14 to 28 feet below the current ground surface. The bedrock at most locations was claystone; however, Arapahoe sandstone was encountered on the north side of Area 1, the southeast corner of Area 3, and at Area 5. The bedrock surface map was revised to reflect these additional 25 locations and is provided below (Figure 3).

The bedrock surface confirms the presence of paleoscour in the bedrock across the center of the 903 Pad area and extending to the east. This directs groundwater flow to the east. Groundwater flow modeling concludes that most groundwater flow is to the east (DOE 2005a). A conceptual cross-section showing the paleoscour and other geologic features is presented in Figure 4.





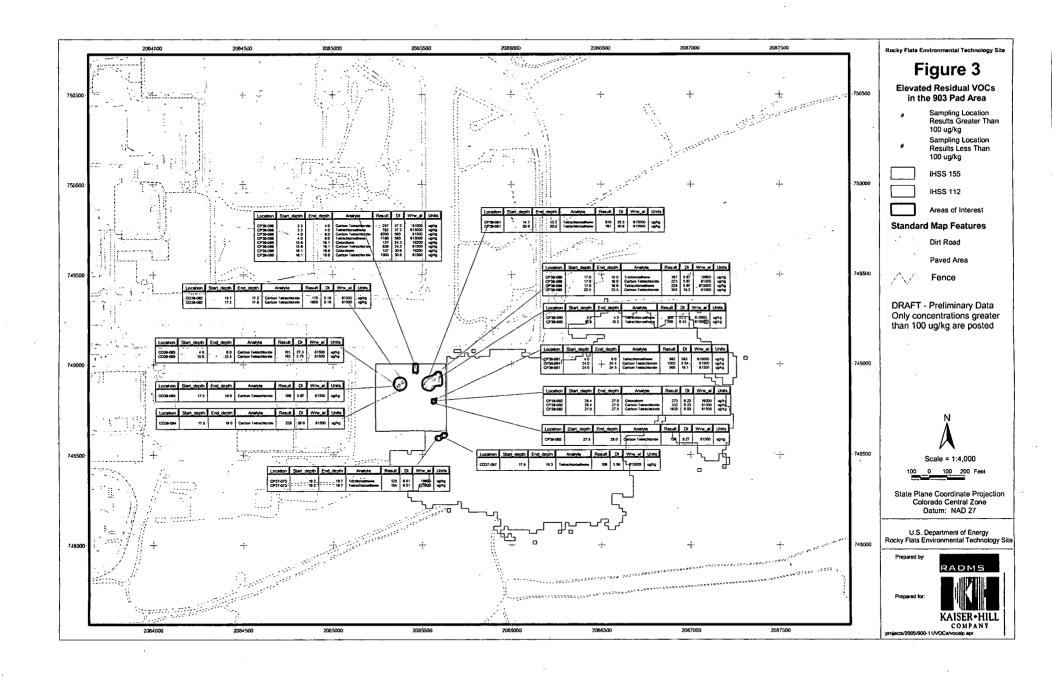


Figure 4 Conceptual Cross-Section of 903 Pad

Ŷ

Fill From Previous Interim Action Water Table Clayey Gravel Location of Soil with High VOC Concentrations (Removed During Interim Action) Clay Lenses Clayey Gravel with Cobbles

Top of Bedrock

Weathered Claystone

At the northeast corner of the Pad, the Arapahoe Sandstone appears to direct a small portion of groundwater flow to the north and northeast. The groundwater flow model indicates that there is a flow divide in that area and that water in the Arapahoe sandstone probably flows both north towards the Mound Plume Treatment System and northeast towards the East Trenches Plume Treatment System.

Analytical Data

The predominant VOCs detected in all the sampling events were tetrachloroethene and carbon tetrachloride. As shown on Figure 3, the highest concentrations, 6,200 ug/kg carbon tetrachloride and 7,180 ug/kg tetrachloroethene, were found at location CP39-066 at a relatively shallow depth (4-6 feet below ground surface). Trichloroethene and chloroform were also detected with the highest concentrations at 167 ug/kg and 273 ug/kg, respectively. No other VOCs were above 100 ug/kg. Because very few of the VOCs were detected above 100 ug/kg (less than 12% of the results), 100 ug/kg was used as an indicator of areas where higher VOCs were present. The detected VOC concentrations and the Wildlife Refuge Worker Soil Action Levels are shown in Table 1.

Many of the analytes detected below 100 ug/kg are degradation products of tetrachloroethene and carbon tetrachloride. These include cis 1,2—dichloroethene, methylene chloride, trichloroethene, and chloroform. Although these may have been part of the original release, they are also very common degradation products. Other VOCs detected such as acetone, naphthalene, trichlorobenzene, toluene, and styrene were probably part of the original release, but likely made up a minor portion of the release. Low levels of methylene chloride, and 2—butanone are most likely a result of cross contamination at the laboratory since they are common laboratory contaminants. As shown in Table 1, many of the analytes detected at lower concentrations were found in the laboratory blanks.

Investigation Results

Based on the results of this investigation and previous investigations, most of the residual VOCs are in the upper part of the vadose zone (the zone of unsaturated soil above the water table). The highest VOC (tetrachloroethene) concentration found in this area was over 100,000 ug/kg in soil that was excavated during the accelerated action. The highest concentration of any VOC below ten feet was carbon tetrachloride at a concentration of 1,820 ug/kg, although most locations were significantly lower. VOC concentrations at the bedrock surface, where Dense Non-Aqueous Phase Liquid (DNAPL) would be expected, range from 0.11 to 1820 ug/kg. The absence of significant VOC concentrations in soil samples taken from the top of bedrock suggest that if DNAPL is present, its areal extent is very limited and does not warrant an accelerated action. Based on VOC concentration and areal extent, the significant VOC sources were in the upper 6 feet below ground surface and were removed during the previous accelerated actions.

At locations where significant DNAPL was found below the water table:

- Soil contamination was mostly below the water table where it could act as a continuing source of groundwater contamination.
- Only residual soil contamination in these areas was found in the vadose zone, in small areas where the release occurred.
- Very high VOC concentrations in soil or DNAPL were found beneath and/or downgradient
 of the release at the contact with low permeability materials, such as claystone, where the
 DNAPL tended to pool in low spots.

At RFETS, DNAPL was found at both Individual Hazardous Substance Site (IHSS) 118.1-Carbon Tetrachloride Spill and IHSS 153 – Oil Burn Pit #2 where pools of DNAPL were found on the top of the bedrock claystone surface. At the 903 Pad, the high concentrations of VOCs were found in the upper six feet of soil and very low VOC concentrations were found below the water table. Soils directly below the very highest contaminant concentrations did not contain significant concentrations, either below the water table, or at the top of the claystone surface, indicating that significant DNAPL is not present at the 903 Pad.

Conclusions

The majority of the VOC contaminated soils that potentially could act as a continuing source of groundwater contamination were removed during 903 Pad accelerated action. Based on the investigation results, there is no evidence that a significant VOC source area remains and therefore, an accelerated action, including additional soil removal, is not required. However, as described in the Sitewide Groundwater IM/IRA (DOE 2005a), residual soil contamination will be addressed using enhanced biodegradation to improve the groundwater quality in this area.

Given the geology and history of the 903 Pad area, there are a number of possible reasons why the higher contaminant concentrations of VOCs might remain close to the surface where they were spilled.

- The releases were a result of small sources spread out over a large area. No more than 55 gallons of fluid could be released from any given drum at any time. Because the release was spread out over a large area, most could be adsorbed onto the soil before reaching the water table.
- The releases likely occurred over time from small leaks as the drums corroded, rather than from catastrophic drum failure. This allowed the VOCs to slowly adsorb into the near surface soils rather than penetrating deeper. The VOCs were mixed with other lessdense organic liquids such as coolants, hydraulic oil, and cutting oils, that may have further slowed migration. In contrast, the DNAPL at IHSS 118.1 occurred because of large volumes of carbon tetrachloride were released quickly at a single location.
- Clay and caliche layers likely restricted downward migration. The alluvium present has a high proportion of clay, and clay lenses were encountered beneath Area 1 where the highest VOC concentrations were found during the 903 Pad remediation.
- The asphalt cover placed over the 903 Pad reduced the percolation of groundwater through the contaminated soils, minimizing downward migration of contaminants.

Enhancement of Groundwater Quality at the 903 Pad

Because residual VOC is present after completion of previous source removal action, *in-situ* biodegradation was initiated to further enhance groundwater quality at the 903 Pad. An amendment was inserted in three arcs across the major downgradient contaminated groundwater flow path. The amendment was inserted into the subsurface through Geoprobe holes and boreholes that were placed at regularly spaced intervals across the flow path through the potentially contaminated intervals. The placement of the amendment is documented in a contact record that includes a map of the insertion points (Appendix B).

References

EG&G, 1995, Groundwater Geochemistry Report for the Rocky Flats Environmental Technology Site, Final Report, Vol. III of the Sitewide Geoscience Characterization Study, Rocky Flats, Golden, Colorado

DOE, 2000, Characterization Report for the 903 Drum Storage Area, 903 Lip Area and Americium Zone, RF/RMRS-99-427.UN, Rev. 1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005a, Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2005b, Industrial Area and Buffer Zone Sampling and Analysis Plan, Addendum #IABZ-05-02, 903 Pad, Volatile Organic Compounds, Rocky Flats Environmental Technology Site, Golden, Colorado, March

Knepper, D. A., 2005, Bedrock Erosion Surface Beneath the Rocky Flats Alluvial Fan, Jefferson and Boulder Counties, Colorado, the Mountain Geologist, Volume 42, Number 1, Rocky Mountain Association of Geologists, Denver, Colorado, January.

Location		End	■ 1. No. (2007) (1.10 × 1.	Result	Wildlife Refuge		Validation
Code	Depth (Feet)	Depth (Feet)		(ug/kg)	Worker Soil S Action Level	Qualifier Codes	Qualifier Code
				,	(ug/kg)	2 2	
Area 1				,		·	
CP38-085	4	6	Cis 1,2-Dichloroethene	18	*	J	V1
CP38-085	4	6	Tetrachloroethene	76.3	615000	-	V1
CP38-085	24	24.5	Carbon Tetrachloride	12.8	81500	-	V1
CP38-085	24	24.5	Cis 1,2-Dichloroethene	14.4	*	-	V1
CP38-085	24	24.5	Tetrachloroethene	66.9	615000	-	V1
CP38-085	24	24.5	Trichloroethene	14.2	19600	-	V1
CP38-085	24.5	26	Cis 1,2-Dichloroethene	0.787	*	J	V1
CP38-086	4	6	Cis 1,2-Dichloroethene	18	•	J	V1
CP38-086	13.5	14.5	Cis 1,2-Dichloroethene	3.4		J	V1
CP38-086	24	24.5	Carbon Tetrachloride	43.2	81500	-	V1
CP38-086	24	24.5	Cis 1,2-Dichloroethene	39.3	•		V1
CP38-086	24	24.5	Tetrachloroethene	94.8	615000	-	V1
CP38-086	24	24.5	Trichloroethene	24.4	19600	-	V1
CP38-086	24.5	26	Carbon Tetrachloride	34	81500	-	V1
CP38-086	24.5	26	Cis 1,2-Dichloroethene	28.9	*	-	V1
CP38-086	24.5	26	Tetrachloroethene	59.8	615000	-	V1
CP38-086	24.5	26	Trichloroethene	21.3	19600	-	V1
CP38-086	26	27	Carbon Tetrachloride	27.6	81500	-	V1
CP38-086	26	27	Cis 1,2-Dichloroethene	10.5	*	J	V1
CP38-086	26	27	Tetrachloroethene	25.9	615000	-	V1
CP38-086	26	27	Trichloroethene	21.8	19600	•	· V1
CP38-087	3	4	Cis 1,2-Dichloroethene	2.8	*	J	V1 ·
CP38-087	3	. 4	Tetrachloroethene	17	615000	В	V1
CP38-087	3	4	Cis 1,2-Dichloroethene	3.1	•	J	V1
CP38-087	14.5	15	Cis 1,2-Dichloroethene	33.9	+	-	V1
CP38-087	14.5	15	Tetrachloroethene	12.2	615000	В	V1
CP38-087	23.9	24.4	Cis 1,2-Dichloroethene	0.58	•	J	V1
CP38-087	23.9	24.4	Tetrachloroethene	37.1	615000	-	V1
CP38-087	24.4	24.9	Carbon Tetrachloride	19.5	81500	-	V1
CP38-087	24.4	24.9	Cis 1,2-Dichloroethene	5.4	•	J	V1
CP38-087	24.4	24.9	Tetrachloroethene	29.6	615000	-	V1
CP38-087	24.4	24.9	Trichloroethene	26	19600	-	V1
CP38-088	3.4	4	Acetone	7.1 .	102000000	. J	V1
CP38-088	3.4	4	Methylene chloride	2	2530000	JB	JB1
CP38-088	3.4	4	Tetrachloroethene	3.8	615000	J	V1
CP38-088	3.4	4	Trichloroethene	2.8	19600	J. J	V1
CP38-088	4	6	Acetone	6.4	102000000	J	V1
CP38-088	4	6	Methylene chloride	1.8	2530000	JB	JB1
CP38-088	4	6	Tetrachloroethene	0.51	615000	J	V1
CP38-088	4	6	Trichloroethene	0.62	19600	J	V1
CP38-088	13.4	14.4	Acetone	6.7	102000000	J	V1

Location			Cesuits of VOC San		Wildlife Refuge		/ ∴Validation ∜
Code		Depth		(ug/kg)	Worker Soil	Qualifier	Qualifier Code
多多的	(Feet)	(Feet)			Action Level:	Codes	
CP38-088	13.4	14.4	Methylene chloride	1.6	(ug/kg) 2530000	JB	JB1
CP38-088	13.4	14.4	Tetrachloroethene	0.32	615000	J	V1
CP38-088	17.1	18.1	Acetone	11	102000000	J	V1
CP38-088	17.1	18.1	Carbon Tetrachloride	9.7	81500	-	V1.
CP38-088	17.1	18.1	Chloroform	1.3	19200	J	V1
CP38-088	17.1	18.1	Methylene chloride	1.6	2530000	JB	JB1
CP38-088	17.1	18.1	Styrene	0.14	123000000	JB	JB1
CP38-088	17.1	18.1	Tetrachloroethene	14	615000	-	V1
CP38-088	17.1	18.1	Toluene	0.15	31300000	JB	V1
CP38-088	17.1	18.1	Trichloroethene	11	19600	-	V1
CP38-088	23	23.7	Acetone	8.5	102000000	J	V1
CP38-088	23	23.7	Cis 1,2-Dichloroethene	1.6	*	J	V1
CP38-088	23	23.7	Methylene chloride	2.6	2530000	JB	JB1
CP38-088	23	23.7	Tetrachloroethene	0.27	615000	J	· V1
CP38-088	23.7	24.1	Acetone	8	102000000	J	V1
CP38-088	23.7	24.1	Carbon Tetrachloride	0.78	81500	J	. V1
CP38-088	23.7	24.1	Cis 1,2-Dichloroethene	4	*	J	V1
CP38-088	23.7	24.1	Methylene chloride	2.9	2530000	JB	JB1
CP38-088	23.7	24.1	Tetrachloroethene	0.91	615000	J	V1
CP38-088	23.7	24.1	Trichloroethene	0.55	19600	J	V1
CP38-089	3	4	Tetrachloroethene	10.6	615000	•	V1
CP38-089	17	18	Carbon Tetrachloride	223	81500	Е	V1
CP38-089	17	18	Cis 1,2-Dichloroethene	2.32		J	V1
CP38-089	17	18	Tetrachloroethene	228	615000	E	V1
CP38-089	17	18	Trichloroethene	167	19600	-	V1
CP38-089	21.5	22.5	Carbon Tetrachloride	22.4	81500	•	V1
CP38-089	21.5	22.5	Tetrachloroethene	16.5	615000	•	V1
CP38-089	21.5	22.5	Trichloroethene	7.18	19600	•	V1
CP38-089	22.5	23.5	Carbon Tetrachloride	305	81500	E	, V1
CP38-089	22.5	23.5	Tetrachloroethene	77.7	615000	-	V1
CP38-089	22.5	23.5	Trichloroethene	54.8	19600	•	V1
CP38-090	3.3	4	Acetone	9	102000000	J	V1
CP38-090	3.3	4	Methylene chloride	1.9	2530000	JB	JB1
CP38-090	3.3	. 4	Tetrachloroethene	2.4	615000	J	V1
CP38-090	3.3	4	Trichloroethene	0.69	19600	J	V1
CP38-090	4	6	Acetone	9.6	102000000	J	V1
CP38-090	4	6	Methylene chloride	1.8	2530000	JB	JB1
CP38-090	4	6	Tetrachloroethene	0.44	615000	J	V1
CP38-090	4	6	Trichloroethene	0.27	19600	J	V1
CP38-090	21	22	2-Butanone	2.2	192000000	.: J	. V1
CP38-090	21	22	Acetone	10	102000000	J	V1
CP38-090	21	22	Methylene chloride	1.6	2530000	JB	JB1

			Results of VOC San				
Location		End	Analyte	Result	Wildlife Refuge	Lab Result Qualifier	Validation
Code	Depth (Feet)	Depth (Feet)		(ug/kg)	Worker Soil Action Level	Codes	Qualifier Code
	(,, 000)	(1 000)			(ug/kg)		
CP38-090	21	22	Tetrachloroethene	3.7	615000	J	V1
CP38-090	21	22	Trichloroethene	1.3	19600	J	V1
CP38-090	22	23	Carbon Tetrachloride	8.4	81500	-	V1
CP38-090	22	23	Chloroform	0.46	19200	J	V1
CP38-090	22	23	Methylene chloride	1.8	2530000	JB	JB1
CP38-090	22	23	Tetrachloroethene	43	615000	-	V1
CP38-090	22	23	Trichloroethene	5.3	19600	J	V1
CP39-059	3.2	4.5	Tetrachloroethene	19.6	615000	В	J1
CP39-060	3.4	4.5	Cis 1,2-Dichloroethene	10	*	J	V1
CP39-060	3.4	4.5	Tetrachloroethene	109	615000	-	V1
CP39-060	4.5	6	Cis 1,2-Dichloroethene	12.9	*	-	V1
CP39-060	4.5	6	Tetrachloroethene	36.9	. 615000	-	V1
CP39-060	11.7	11.9	Cis 1,2-Dichloroethene	4.1	+	J	V1
CP39-060	11.7	11.9	Tetrachloroethene	40	615000	-	V1
CP39-060	15.8	16.3	Cis 1,2-Dichloroethene	116	•	-	V1
CP39-060	15.8	16.3	Tetrachloroethene	269	615000	E	V1
CP39-060	15.8	16.3	Trichloroethene	12.9	19600	-	V1
CP39-060	16.3	16.8	Cis 1,2-Dichloroethene	27.7	*	-	V1
CP39-060	16.3	16.8	Tetrachloroethene	61	615000	-	V1
CP39-061	3.5	4.5	Tetrachloroethene	14.2	615000	-	V1
CP39-061	4.5	6	Tetrachloroethene	21.3	615000	-	V1
CP39-061	14.2	14.7	Tetrachloroethene	19	615000	-	V1
CP39-061	14.7	15.2	Cis 1,2-Dichloroethene	11	. +	-	V1
CP39-061	14.7	15.2	Tetrachloroethene	910	615000	E	V1
CP39-061	14.7	15.2	Trichloroethene	71.4	19600	•	V1
CP39-061	16.8	17.3	Tetrachloroethene	63.5	615000	-	V1
CP39-061	19.5	20	Tetrachloroethene	47	615000	-	V1
CP39-061	20	20.5	Carbon Tetrachloride	56.2	81500	-	V1
CP39-061	20	20.5	Cis 1,2-Dichloroethene	5.64	*	J	V1
CP39-061	20	20.5	Tetrachloroethene	781	615000	Е	V1
CP39-062		4.5	Cis 1,2-Dichloroethene	24	*	J	V1
CP39-062	3.4	4.5	Tetrachloroethene	81.2	615000	•	V1
CP39-062	4.5	6	Cis 1,2-Dichloroethene	89.2	•	•	V1 :
CP39-062	4.5	6	Tetrachloroethene	35	615000	-	V1
CP39-062	19.1	19.5	Cis 1,2-Dichloroethene	29.1	*	· •	V1
CP39-062	19.1	19.5	Tetrachloroethene	69.3	615000	-	V1
CP39-062		19.5	Trichloroethene	6.55	19600	_	V1
CP39-062	21	22	Carbon Tetrachloride	35.7	81500	_	V1
CP39-062	21	22	Cis 1,2-Dichloroethene	9.4	•	-	V1
CP39-062	21	22	Tetrachloroethene	99.1	615000		V1
CP39-062		23	Carbon Tetrachloride	20.8	81500		V1
CP39-062		23	Cis 1,2-Dichloroethene	9.4	*	J	V1
CF39-002	- 22	23	Cis 1,2-Dictilotoctricite	J. -4	L	<u> </u>	<u> </u>

Location			Analyte		Wildlife Refuge		Validation
Code	Depth	Depth	Allalyte	(ug/kg)	Worker Soil	Qualifier	Qualifier Code
	(Feet)	(Feet)			Action Level	Codes	
		200			(ug/kg)		
CP39-062	22	23	Tetrachloroethene	39.1	615000	· ·	V1
CP39-063	3	4	Cis 1,2-Dichloroethene	1.6	*	J	V1
CP39-063	4.5	6	Cis 1,2-Dichloroethene	7.08	*	-	V1
CP39-063	13.5	14	Cis 1,2-Dichloroethene	31.9	*	•	V1
CP39-063	13.5	14	Tetrachloroethene	47.8	615000	В	J1
CP39-063	14	14.5	Cis 1,2-Dichloroethene	44.6	*	•	V1
CP39-063	14	14.5	Tetrachloroethene	62.4	615000	В	J1
Area 2							
CP39-064	3.5	4.5	Acetone	8	102000000	J	V1
CP39-064	3.5	4.5	Methylene chloride	2.1	2530000	JB	JB1
CP39-064	3.5	4.5	Naphthalene	0.56	3090000	JB	JB1
CP39-064	4.5	6	1,2,4-Trichlorobenzene	0.51	9230000	JB	JB1
CP39-064	4.5	6	1,2-Dichlorobenzene	0.19	31200000	JB	JB1
CP39-064	4.5	6	Acetone	11	102000000	J	V1
CP39-064	4.5	6	Methylene chloride	2.2	2530000	JB	JB1
CP39-064	4.5	6	Naphthalene	1.1	3090000	JB	JB1
CP39-064	4.5	6	Styrene	0.086	123000000	JB .	JB1
CP39-064	9.5	10.5	1,2,4-Trichlorobenzene	0.32	9230000	JB	JB1
CP39-064	9.5	10.5	1,2-Dichlorobenzene	0.12	31200000	JB	JB1
CP39-064	9.5	10.5	Acetone	18	102000000	J	· V1
CP39-064	9.5	10.5	Methylene chloride	2	2530000	JB	JB1
CP39-064	9.5	10.5	Naphthalene	0.71	3090000	JB	JB1
CP39-064	10.5	11.5	Acetone	6.4	102000000	· J	V1
CP39-064	10.5	11.5	Methylene chloride	2	2530000	JB	JB1
CP39-064	10.5	11.5	Naphthalene	0.52	3090000	JB	JB1
CP39-064	14.2	15.2	Acetone	6.5	102000000	J	V1
CP39-064	14.2	15.2	Methylene chloride	2.4	2530000	JB	JB1
CP39-064	14.2	15.2	Naphthalene	0.43	3090000	JB	JB1
CP39-064	15.2	16.2	Acetone	6.1	102000000	J	V1
CP39-064	15.2	16.2	Methylene chloride	2	2530000	JB	JB1
CP39-066	3.3	4	Carbon Tetrachloride	257	81500	E	V1
CP39-066	3.3	4	Tetrachloroethene	782	615000	E	V1
CP39-066	4	6	Carbon Tetrachloride	6200	81500	Ē	V1
CP39-066	4	6	Tetrachloroethene	7180	615000	E	V1
CP39-066	15.6	16.1	Carbon Tetrachloride	638	81500	E	V1
CP39-066	15.6	16.1	Chloroform	137	19200	-	V1
CP39-066		16.1	Tetrachloroethene	57.7	615000	-	V1
CP39-066	16.1	16.6	Carbon Tetrachloride	1300	81500	E	V1
CP39-066	16.1	16.6	Chloroform	137	19200	•	V1
Area 3		L,	L.,		L		<u></u>
CP38-091	4	6	Tetrachloroethene	682	615000	E	V1
0, 30-091			Totachiologuielle	1 002	<u> </u>		V 1

			Results of VOC San				
Location Code	Depth		Analyte	Result (ug/kg)	Wildlife Refuge Worker Soil	Lab Result Qualifier	Validation Qualifier Code
	(Feet)	(Feet)			Action Level (ug/kg)	Codes	
CP38-091	24	24.4	Carbon Tetrachloride	1000	81500	Е	J1
CP38-091	24	24.5	Carbon Tetrachloride	995	81500	E	J1
CP38-091	24	24.4	Chloroform	24	19200	-	V1
CP38-091	24	24.4	Cis 1,2-Dichloroethene	4	*	J	V1
CP38-091	24	24.5	Tetrachloroethene	31.7	615000	•	V1
CP38-091	24	24.4	Tetrachloroethene	7.48.	615000	•	V1
CP38-091	24	24.4	Trichloroethene	15.1	19600	-	V1
CP38-091	24	24.5	Trichloroethene	55.9	19600	•	V1
CP38-092	3.5	5.5	Cis 1,2-Dichloroethene	2.69	•	J	V1
CP38-092	3.5	5.5	Tetrachloroethene	35.5	615000	-	V1
CP38-092	5.5	6	Cis 1,2-Dichloroethene	0.634	•	J	V1
CP38-092	5.5	6	Tetrachloroethene	6.1	615000	-	V1
CP38-092	20	21	Cis 1,2-Dichloroethene	0.934	•	J	V1
CP38-092	26.4	27	Carbon Tetrachloride	332	81500	Ε	J1
CP38-092	26.4	27	Cis 1,2-Dichloroethene	1.7	*	J.	V1
CP38-092	26.4	27	Chloroform	273	19200	E	V1
CP38-092	26.4	27	Tetrachloroethene	16.5	615000	-	V1
CP38-092	26.4	27	Trichloroethene	22.5	19600	•	V1 .
CP38-092	27	27.5	Carbon Tetrachloride	1820	81500	E	J1
CP38-092	27	27.5	Cis 1,2-Dichloroethene	3.1	*	J	V1
CP38-092	27	27.5	Chloroform	67.5	19200	-	V1
CP38-092	27	27.5	Tetrachloroethene	19.3	615000	•	V1
CP38-092	27	27.5	Trichloroethene	85	19600	•	V1
CP38-093	4	6	Tetrachloroethene	12.6	615000	-	V1
CP38-093	27.5	28	Carbon Tetrachloride	126	81500	•	V1
Area 4			<u> </u>				<u></u>
CO38-082	3	5	Methylene chloride	1.5	2530000	JB	JB1
CO38-082	3	5	Tetrachloroethene	0.4	615000	JB	JB1
CO38-082	3	5	Toluene	0.14	31300000	JB	JB1
CO38-082	5	- 6	Acetone	18	102000000	J	V1
CO38-082	5	6	Methylene chloride	1.4	2530000	JB	JB1
CO38-082	5	6	Tetrachloroethene	0.46	615000	JB	JB1
CO38-082	5	6	Toluene	0.13	31300000	JB	JB1
CO38-082	16.7	17.2	Acetone	56	102000000		V1
CO38-082	16.7	17.2	Carbon Tetrachloride	170	81500	-	V1.
CO38-082	16.7	17.2	Chloroform	6.6	19200	-	V1
CO38-082	16.7	17.2	Methylene chloride	1.3	2530000	JB	JB1 _
CO38-082	16.7	17.2	Tetrachloroethene	0.68	615000	JB	JB1
CO38-082	16.7	17.2	Toluene	0.12	31300000	JB	JB1
CO38-082	16.7	17.2	Trichloroethene	0.24	19600	. J	V1
CO38-082	17.2	17.8	1,1-Dichloroethane	0.25	22500000	J	V1
CO38-082	17.2	17.8	1,1-Dichloroethene	7.8	17000	•	V1

Location Code	Start Depth (Feet)		Analyte	Result (ug/kg)	Wildlife Refuge Worker Soll Action Level (ug/kg)		Validation Qualifier Code
CO38-082	17.2	17.8	1,2-Dichloroethane	0.88	106000	J	V1
CO38-082	17.2	17.8	Acetone	18	102000000	J	V1
CO38-082	17.2	17.8	Bromodichloromethane	0.44	617000	J	V1
CO38-082	17.2	17.8	Carbon Tetrachloride	1800	81500	Е	J1
CO38-082	17.2	17.8	Chloroform	61	19200	-	V1
CO38-082	17.2	17.8	Methylene chloride	1.8	2530000	JB	JB1
CO38-082	17.2	17.8	Tetrachloroethene	1.4	615000	JB	JB1
CO38-082	17.2	17.8	Toluene	0.11	31300000	JB	JB1
CO38-082	17.2	17.8	Trichloroethene	3	19600	J	V1
CO38-083	17.5	18	Carbon Tetrachloride	109	81500	•	V1
CO38-084	17.5	18	Carbon Tetrachloride	228	81500	Ε	V1
CO38-084	17.5	18	Chloroform	13.7	19200	-	V1
CO38-085	3	4	Carbon Tetrachloride	47	81500	-	V1
CO38-085	4	6	Carbon Tetrachloride	101	81500	-	V1
CO38-085	15	15.5	Carbon Tetrachloride	165	81500	•	V1
CO38-085	15	15.5	Chloroform	15.1	19200	•	V1
CO38-085	15.5	16	Carbon Tetrachloride	45.4	81500	-	V1
CO38-085	15.5	16	Chloroform	41.4	19200	-	. V1
CO39-039	10	12	Carbon Tetrachloride	55.3	81500		V1
CO39-039	16.6	. 17.1	Carbon Tetrachloride	33.2	81500	-	V1
CO39-039	16.6	17.1	Chloroform	24.6	19200	-	V1
Area 5			-	<u> </u>		· · · · · · · · · · · · · · · · · · ·	······, · · · · · · · · · · · · · · · ·
CP37-073	2.4	4.4	Tetrachloroethene	14.1	615000		V1
CP37-073	4.4	6	Tetrachloroethene	6.38	615000	-	V1
CP37-073	18.7	19.2	Tetrachloroethene	17.5	615000	-	V1
CP37-073	18.7	19.2	Trichloroethene	6.18	19600	-	V1
CP37-073	19.2	19.7	1,1-Dichloroethene	6.61	17000	-	V1
CP37-073	19.2	19.7	Tetrachloroethene	154	615000		V1
CP37-073	19.2	19.7	Trichloroethene	123	19600		. V1
CQ37-086	18.7	19.2	Tetrachloroethene	18.8	615000	-	V1
CQ37-086	20	20.2	Tetrachloroethene	60.2	615000	-	V1
CQ37-086	20	20.2	Trichloroethene	59.4	19600	-	V1
CQ37-087	4.3	6	Tetrachloroethene	17.7	615000		V1
CQ37-087	17.8	18.3	Tetrachloroethene	109	615000	-	V1
CQ37-087	17.8	18.3	Trichloroethene	18.6	19600	-	V1

No action level for specific isomer
 B = Detected in laboratory blank
 E = Estimated value exceeding calibration range
 J = Estimated value below required detection limit
 V1 = Verified data

Groundwater IM/IRA - 903 Pad VOC Investigation

Area 1

Borehole Logs



	incoho	Ma Niii	mhar	() T (コヘ・ニ	ひス				SY SITE BOREHOLE LOG PAGE 1 OF S	3
	.ocauo)ate: _	3 9	os <u>44</u>		77 Ea	ISC A	856	75 N 7.	18 <i>5</i> 9.34	Area: 100-11 (903 Rd)	;
0	Seolog Orilling	ist: <u> </u>	Tu:	Par	erpri	OBC	9620	TITAL		Company: URS Project No.: GR 210100 Sample Type: AMC DUAL TUBE	<u>2</u>
	RMRS PPRO		GING	SUPE	RVIS	OR				DATE	_
TOPPOOTTOM SOC TO:	TOPRECTION	PRET OF CORE INDITERVAL	SAMPLE NAMBER	FRACTURE	BEDDING	GRAM BIZE DISTANSITION	USCS	DEPTH IN	SOIV LITHOLOGIC 100	SAMPLE DESCRIPTION	 ·
	2.6 4.0 3.5 3.5 8.0	35/40	4.0 A				FILLSW	- 2 3 -		Very back grayish brown 10483/ Fini-coarse well-graded, subround ste, sightly moist EFILL brownish yellow 1048 6/6 Coarse, goody graded, subround, stetal diente other moist sading but to sightly moist 5.5-80 sendy granel with sand, tyellowish brown, 1048 6/4/ coarse, goody granel with sand, subround to 12. Pelayer granel with sand, yellowish rd 542 4/6/ yellowish rd 542 4/6/ coarse, poorly granel, subround, coarse, poorly granel, subround, stete diente, sightly moist	
		40						- 9 <u>-</u>	9	étzite dionte, slightly moist	
NOT	ES: Ge	nerat	uscs i	s modif	ed for t	his loa	as lolk	NS.		Procedure No. RMRS/OPS-PRO:101	

Materials amounts are estimated by % volume instead of % weight.

(1) Sadly broken core, accurate cotage measurements not possible.

(2) Gore breaks cannot be matched, accurate tootage measurements not possible.

Revision 0



Borehole Number: CT30 085 Borehole Number: CT30 085 Date: 3 9 05 Date: 3 9 05 Responsible Continue Company: UES Geologist 2 TutA Drilling Equip: Ams GO-LERROBE 4720 TITAN RMRS LOGGINGS UPERVISOR APPROVAL DATE SAMPLE DESCRIPTION DATE SAMPLE DESCRIPTION FINE Conserve will graded of the standard of the stan	P	ROCK	YFL	ATS	ENVI	RON	MENI	[AL]	TECHN(LOG	Y SITE BOREHOLE LOG
Date: J9 05 Geologist 2 TUTA Drilling Equip: Ams Governore 9620 TITAN RMRS LOGGING SUPERVISOR APPROVAL 2.6 4.5 4.0 5.7 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	I B	orehol	le Nur	nber:		<u> </u>	\Box \mathcal{O} \mathcal{O}	<u>S</u>	N 7	191306	Surface Floration:
Geologist TUTA Drilling Equip: And POWERPRORE 4/20 TITAN RMRS LOGGING SUPERVISOR APPROVAL DATE SAMPLE DESCRIPTION CC 4.0 Gravily S.D. Yery dark grysh brown loyry, Shrond ste, sightly most. Effect of the step of the	· D	ate: _	3/9/	05	<u>: </u>	<i>31</i>		050	77 € 20	859.34	
RMRS LOGING SUPERVISOR APPROVAL 1	G	eologi	st: <u>_</u> 2	. Tu	TA	·		M -			
APPROVAL BY 10 September 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	D	rilling (Equip.	: <u>Am</u> :	s yaw	ERPR	OBE	4620	TITAN		
The state of the s	R	MRS	LOG	GING	SUPE	RVIS	OR		•		
SAMPLE DESCRIPTION THE WOOD IN THE WOOD I	Á	PPRO	DVAL	·		·		<u> </u>			DATE
F O 4.0' Granlly soul Yery dark gryssh brown loyseys, Fine-coarse well-grackly soul, Sibround, gte, sightly most EFILL SW - 2 - GC 4 Granly grown I my soul, Coarse goods grand of subround, Stand dinte att miss you g down to sightly most So Sendy grand my clay It yellowish brown, loyse bly Coarse, goods street will supreme Coarse, goods street will supreme Store down to sightly most Store down to sightly most Store goods street will clay It yellowish brown, loyse bly Coarse, goods street will supreme Store goods street will street will supreme Store goods street will street will supreme Store goods street will street w	ž	ह	, 8 2	£			n š	Ι.	z	Į v	
4.0 4.0 GC 4 4.0 5.5 Chyry grant my sall grantly sand, showing, ste, sightly most [FILL] 4.0 5.5 Chyry grant my sall grantly most [FILL] 4.0 5.5 Chyry grant my sall, stands and sally most grantly subject of sighty most grantly sally solved grantly sally sally stands from sighty most grantly sally sally stands grantly sally sally sally grantly grantly sally sally grantly grantly sally sally grantly grantly sally sally sally sally grantly sally s	68	i ga			200	S S	35	S S	# <u>5</u> v	388	CAMPI E DESCRIPTION
40 5.5 Chayay grant w/ sall subrains 104842 fine coarse, well gradely, subraind, gte, sightly most, EFILL. 3 40 5.5 Chayay grant w/ sall, brownish yellow 1048 0/6, coarse goody gradely, subraind, during to sightly most, start, which was trained to sightly most from the sightly most fr	وٌ قُ	Ď	Z IN Z		5 4	1 2 4	9.5	35	8	- ¥ -	SAMPLE DESCRIPTION
40 5.5 Charge grant w/ sol, subrand of the sol of the s	-	2.6		1	1	1777	-	-			
Tery dark grayish brown 10483/2 Fint-coarse well-gralled; Subround; ste, sightly most, EFILL SW-2 GC # 4.0, 5.5 Charge; grave 1 w/ swl, brownish yellow 1048 0/6 Carse, goody graded, subround; sterk disher storming from a strying of such subround; sterk disher was from wy clar it yellowish browning to 48 6/4 Coarse, goody stredd, subround; sto. h. dishts, wester dry Coarse, goody stredd, subround; sto. h. dishts, wester dry Coarse, goody stradd, subround; sto. h. dishts, wester dry coarse, goody stradd, subround; sto. h. dishts, wester dry coarse, goody stradd, subround; sto. h. dishts, wester dry sto. h. dishts, subround; sto. h. dishts,		17		- [1		ŀ	+	L _		0-4.0' Gravelly sand
4.0° 5.5 Chyey greval my sand, brownish pellows 10 yr 0/6 Coarse goodly graded, subround, status attributes the misst sand of durn to stightly most. Ge 6 Status distributes the provided subround, 1t yellowish brown, 10 yr 8/4; coarse, poorly graded, subround, status distributes mention day (coarse, poorly graded, subround, yellowish and yellowish roll sy 4/4; coarse, poorly graded, subround, for the distributes subround, status distributes subrou		4,	,	1				1			Yery dark grayish brown 10483/2
4.0 5.5 Chyey greval my sun) 3.5 315 A GC 4 4.0 5.5 Chyey greval my sun) brownish pellows 100 kg 6/6 Casse goody graded, subrown of status dishly most Ge 6 Ge 14 8.0 Sendy great my clay It yellowish brown, 10 kg 6/4 Coarse, poorly grade, subrown yellowish ril grady (coarse, poorly grade, subrown yellowish ril grady (coarse, poorly grade), subrown yellowish ril grady yell	1	1.		1	1			ال	-1-		· fine-coarse well-ara DD
4.0° 5.5 Chyey greval my sand, brownish pellows 10 yr 0/6 Coarse goodly graded, subround, status attributes the misst sand of durn to stightly most. Ge 6 Status distributes the provided subround, 1t yellowish brown, 10 yr 8/4; coarse, poorly graded, subround, status distributes mention day (coarse, poorly graded, subround, yellowish and yellowish roll sy 4/4; coarse, poorly graded, subround, for the distributes subround, status distributes subrou		1	1	1							Subround at dulithing
4.0° 5.5 Chyay graval my sml, brownish yellow 10 yr 6/6 Caree goody graded, subround, state dank at moist sml g but to dightly most Ge Ge Ge Ge Ge Ge Ge Ge Ge G						·		,			[FILL]
4.0. 5.5 Chyriy greval w/ sall, brownish yellow 10 yr 6/6 Coarse georly graded, subrown of state dishe att most young state dishe att most young state dishe browning love 6/4. Ge 6 Send great w/ clay lit yellowish browning love 6/4. Coarse goorly stade, subrown yellowish dishe meeting dry. 8.0 4.0 40 60 8.0 12.0 layer years with sand yellowish of 5 4 a 4/6. Coarse, poorly grade, subrown yellowish of 5 4 a 4/6. 60 60 60 80 80 80 80 80 80 80								SW	_ 2		
4.0 3.5 A GC GC GC GC GC GC GC GC GC G	1.		j							• •	
4.0 3.5 A 4.0 Coarse goody graded, subround, sternal diante attraction to year of graded, subround, sternal diante attractions of the sternal diante attractions of the substitution of t							•			1	
4.0 3.5 A 4.0 Coarse goody graded, subround, sternal diante attraction to year of graded, subround, sternal diante attractions of the sternal diante attractions of the substitution of t									- 3	٥	
4.0 3.5 A GC GC GC GC GC GC GC GC GC G		1						٠. ا			
4.0 3.5 A GC GC GC GC GC GC GC GC GC G								ľ			
Coarse, goorly graded, subround, steated disher wist standing of the old subround, steated disher wist standing to subround, subround, subround, subround, standing, subround, subround, standing, subround, s		-		4.0			ľ		-4-		
Coarse, goorly graded, subround, steated disher wist standing of the old subround, steated disher wist standing to subround, subround, subround, subround, standing, subround, subround, standing, subround, s		4.0				. [GC			7.5.5. Clayey greve 1 w/ send,
60 Ge 6 S.5-8.0 Sendy great my clar It yellowish brown, love 8/4, coarse, peoply grade, subround, sto. 12.02 layer grane with sand, yellowish r.d. 5.42 4/49, coarse, poorly grade, subround, coarse, poorly grade, subround, etzite diente, sighty moist.	k	37	315	Α				. 1			Coarse foody are ()
60 Ge 6 S.5-8.0 Sendy great my clar It yellowish brown, love 8/4, coarse, peoply grade, subround, sto. 12.02 layer grane with sand, yellowish r.d. 5.42 4/49, coarse, poorly grade, subround, coarse, poorly grade, subround, etzite diente, sighty moist.			40	'		ŀ		- }	-5-1	///	strite diente eter moist se o
8.0 4.0 8.0 12.0clayer grand with sand, yellowshind sond, subroad, to sarse, poorly grandly, subroad, etzite dionte, slightly moist.	:					.	1		1	4/	Sightly min of
8.0 4.0 8.0 12.0clayer grand with sand, yellowshind sond, subroad, to sarse, poorly grandly, subroad, etzite dionte, slightly moist.										// }	5.5-80 Sendy grant willaw
8.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	<i>i</i>		4				1	٥٠	-6-		it yellowish brown, love 6/4)
8.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4				60					* {		to he poorly staded, subround
8.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4								┢			210 11 / along mont of day.
			×	4				L	_5_}		
								_]		1	
								· - -	[
							افر ر	te and or or		•//	
		8.8			•	1	Γ		_ 8	4	8:0-12:4Clayor gravel with sand
			4.0	·			1	_ابن			Carry Sandy
			40				- 1		ľ	//	strite dicte subrand
			, 3						- 9 - 1	1	slightly most
Norman and the state of the sta		}	. 1			,		L	. <i>I</i>	•//	
North All Control of the Control of				. 4					ľ		
	NOT	ES C		1800	<u>ا</u>	tha ear	et in		-10 P	/ 7	Procedure No. RMRS/OPS-PRO:101

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate botage measurements not possible.

(2) Gore breaks cannot be matched; accurate tootage measurements not possible.

Revision 0



P	OCK Ock	YFI	ATS I	ENVII CP	RONI	MENT	TAL 1	TECHN	OLO	GY SITE BOREHOLE LOG PAGE 2 OF 3
. L	ocatio	n - No	rth: 🔀	49139	⊇ ,Ea	ıst: <u>.2</u>	رر 195 6 د د	75 1	4453	Surface Elevation: 3 MRVEY Area: 100-11 (903 Pad)
,, ,	~.c	_					· · · · ·		-0575	Total Depth:
D	eologi rilling (st. <u> </u>	Tu:	Ban	ERPR	OBE	962	• TITAN	,	Company: URS Project No.: GR210100
1			GING							Sample Type: AMC DUAL TUBE
	MKS PPR(SUFE	K A 124	OK		•	· · · ·	
	1,	19-1	ĔI	-	<u> </u>	T 2				DATE
TOPROTTON SOCION	TOP/ROTTO	PEET OF COP IN INTERNA	SAMPLE NUMBER	FRACTURE	SHOOTS	DISTANSIZE	USCS STABOL	DEPTH IN	SOLV LITHOLOGIC	SAMPLE DESCRIPTION
1.	ļ .				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		GC	- (0	1/1	10 to 11 ft 400 - 4 H.d.
	1		1			•			1/1	576/2. Sals to It olingay
		1.	1		. :		·		6/	1
			ľ					- ((-	15	
	ł		1						//	
<u> </u>]				6.	- 12-	/عرا	- 17.0 - 16.00
	12.6	40			1			•		- 12.0-16.0 Clayer gravel with sand, as above 9.0-12.0.
		4,0		·· .	1					1 as Rove 9.0-12.0.
		7,0		.· ,			1	-13-		
		ļ					. [
		•					- [
					ľ	* .	-	-14-		
;. ' •		:					ŀ		//	(REFUSAL AT 16.0 Ft. OFFSAT
			15.0	ľ					6/	(REFUSAL AT 16.0 FF OFFSET
								-15-		to 14.5 F1 & resume sampling]
			B		· •		- -	• -[
-								- 1/_		
	16.0		16.0		;	C	;c		9	16.0-20-D Clayer gravel of Rand
		2					 	+		16.0-20-D Clayer gravel up rail coarse, poorly scaled, subrounds guartzite, dry. Quartzite boulder from 16.0 - 16.5
		4.0					L	-17-4		balls for
							3			16.0 - 76.3
							_	7	•	
	.							-18-H		
				£ 1"			12.		6	
	1							7		
	1						⋰┝┵	-19-1		
		1						P	6	
			•				Γ	7		
NoT□	L	2052	² €.∞					20 K) P. I.	
	J. Ger	rerat	i Ba	MOCHE	ea for t	nts log	as jolio	ws:	4	Procedure No. RMRS/OPS-PRO: 101

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate lootage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

	oreno ocatio ate: _ ieologi	le Nun n - Nor 3/9 ist: _Z	nber: th: <u>74</u> / 05 Tu 1	9152	Ea	2 85 st. <u>2</u>	0859		OLOGY SITE BOREHOLE LOG Surface Elevation: SULYRY Area: 100-11 (903 Pad) Total Depth: Company: URS Project No.: GR 21010 Sample Type: 1MK DUAL TUBE				
	MRS PPRO		GING :	SUPE	RVIS	OR			· ·.	DATE			
POC DO	TOPRECITOM	PRET OF CORE INTERVAL	SAMPLE	FRACTURE	PEDDING	GRAIN SIZE DISTRIBUTION	USCS	DEPTH IN	SOIL LITHOLOGIC LOG				
			21.5				GC	-20 21-		20-22.0 Clayer grave l up sand,			
	22.0	TD	22.0 REF	is a				— 21 . -	(1)	22.0 REFUSAL			
						•							
							estate disconnection of the second						
NOT	FS: Ga	nerat	uscs i							Procedure No. RMRS/OPS-PRO:101			

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

R	ОСК	Y FL	ATS E	NVI	RON	MENT	'AL.	TCONC	× 00	. ORM PRO.101A
Bo	orehol	e Num	ber: _	CF	38	- 08	75	ECHN)LOG	SY SITE BOREHOLE LOG PAGE OF
Da	ate:	- Nort	n:	Surve	λ_Eα	st:	FULL	ey.		Surface Elevation: Sur-ey Area: 903
1 3	POIOGE	51:^	_ W,t	lizmc					:	Total Depth: 28'
Dr.	illing E	quip.:	_by.	e wis	tera	AP 1	000		<u>:</u> .	Company: URG Project No.:
R	MRS	LOGG	ING S	SUPE	RVIS	OR				75007
AF	PRC	VAL			<u> </u>			·_	1	DATE
Į,,	ž ž	8 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		"		H 8		1	T	DATE
POPP	TOP-OT	TET OF O	SAMP	FACTUR	NOON .	DRAMASU DISTRACON	\$750 874 8 0	14.50 14.50	TUMOTO	SAMPLE DESCRIPTION
		26								0-22' bys - Perassion drill. See Powerprobe logs of details.
		2.0					61	22		Dr yellow brown; sobround gross.
		1.0						140		exty material / pour recovery / 2205-24-26' clay Dk brown;
	.							- 24		low placks; some south
										625-23695 (Grey makerial)
						4	4	>		Top - 160 is borrock E collected in weathered bisrock
								-26		Famo/poor grading / dry and
				:			-	-27 -		tightly pecked / some bedding planes visible / nonplaction
						1		28-		TD-28' 195
							-	4		
					. -					11)
							-			100
	1			1			上	1		
NOTES:	(1) É	inais an ladly br	nounts oken c	are psi ore, ac	imated curate	by % v	ofume mass	instead of	~	ble
	127	OI O DE	ava ca	niuot o	matci	100, ac	curate	tootage me	asuren	nents not possible. Date effective: 12/31/98 Page 27 of 28

14011-430-0134-9309 Form GT.1ANO3/01/4/21

M

	Ĺ	1
	7	لا
نر	_	

	Lo Da Ga Dr	cationate: _eologilling	n - N 3-1' ist: Z Equip	orth: _ +-os 4 Pa o.: _Ar	chero ns Au	У Е	AE 9	irvey	OGY SITE BOREHOLE LOG PAGE_1 OF 2 Surface Elevation: Survey Area: 900~11 (903 Page) Total Depth: 12.5' Company: URS Project No. GR210100 Sample Type: AMS Duar TURE					
	OF CORE	P/BOTTOM OF	OVA POLICIONAL POLICIO	SUREMENT	NUMBER	MALE	GRAIN SIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN	OCOGIC OCOGIC	DATE	_		
80		4.0	4.0	4.0 A VOC FD				GN	3 - 4 - 5 - 6 - 7 - 8 - 9 - 9		SAMPLE DESCRIPTION O.4.0 Sand-silt-clay mixture with gravel Dark brown 7.5483/4 porry-graded gravel 0.05 in subangula quantity Silt/clay-soft, slightly moist [Fill] Soft, slightly moist in upper 2 feet (4-6') Stiff, slightly moist in lower 2 feet (6-8') Gravel-poolly graded subangular qtzite (0.1 in), (at 6-6.1' 5 % more) Sand-coarse subangular Subrounded			
NO	OTES:	Gen	eral: (ecs	is modi	fied for thi	is log as	follows	s:	<u>'-1</u>	December 11 Di Mariana and and			

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

edure No. RMRS/OPS-PRO.101

Revision 0

Date effective: 12/31/98

Page 27 of 28	NI 5110111015			• • • • •			(CA	JO40XAI.T	O ano 11(0)	6 +C10-0
Date effective: 12/31/98	possible. Surements no	otage mea	irate to	d, accu	matche	ed fon	ıka csu	ore brea	(s) c	
0 noisivaA		% to beats	ni emul 21.0590	00 % %	d beish of elsit	1.6. 3001 16. 3001	ken.co burs s	ans ann adly bro	·2000-11 ·20 (1)	
Procedure No. RMRS/OPS-PRO.101		· :s	wollot	se gol :	sirth not	pogipor	n ai 8≎)SU :16' One alti	neneco neteM	:0317
		10	2 1							.271(
				į		i				
•	i	Γ	7	ı					- "	i
		i,			- }		•		- [
		1 "								-
		<u> </u>	4		-	ŀ			- 1	
>									1	
		-8	/			- I ·		- 1 -	:	
			1	• 1						
		-	\dashv					1	. .	1.
		1,				-			.]	
		7.1.	7	-1	'		1		1	1
		L					• .		-	İ
	- 1									
	1	9/	_	ı	1	1.	\cdot	ŀ	1 .	-
			1			ľ		1	·	ŀ
		F	4	1.			· ·			
			1.		1	1 .	.	l	1.	
		-21.		-	1.	-1	1			
Refusal on 1st hole. Offset 5/50th	C.L.				1		٠٤٠,		- [.	
, , , , , ,	3" 1/			7		·		50	54	1 5
	1.7/	/	_	ļ		1	1	į ·		' _ '
		2	-1		1		20	7].		1
		クト	-	1		ł			1	1
			_] . `	· .	1	1	<u>5⋅ε</u>		1	
. 3	1//	71. 21-	٦.	1	1	1	.[
Retusal on Sma hot.	5.21 - 1/	/ - ·	4	1	1			1	ŀ	Į
is Grandly sandy chay as above		1	1	1		1	I	1 .		ŀ
, , , , , , , , , , , , , , , , , , , ,	"'-"\/ <i>]</i>	/ ~ / –	1	1	1	1		L.	L.	
		L		l l		l	ľ	04	12.0	-07
	1/2	「 「	1	ĺ			! .	'	l	
		J-11-	1	1	1	ļ .				.,
		"		ļ ·	'	'	l			
	1/1	}- -		l	l -			1. 1		
2 Sec above	1-01///	1	72							
• •		10/-	-		 			<u> </u>		
SAMPLE DESCRIPTION	LITHOLOGIC	, g	9,6	ORAM SIZE	, a	> 3	3 2	PEST OF CORE IN INTERVAL: (FIELD LEASUREMENT	इ इ	_ 2 ਤੋਂ
	٤٥٤	DEPTH IN	POBMAS \$380	5 5	ANGLE DNIOGE	ANGLE	HARMON	に題る	PALEBAYE OL PIOLLOPIO	OF CORE
		Ž.		ğ N	" 8	~ R	, 3 m	EET OF CORE IN INTERVAL: (FIELD EASUREMENT	<u>₹</u>	^ # Z
TAO	-							ــــــــــــــــــــــــــــــــــــــ	OAG	14
	•			אר	761AV	י י	נואח :	9907		•
HE TYPE: AMS DUAL TUBE	durec									
Dainy: USS Project No. (4210	Tme2	VANT.	(ص	b 3¢	१७७३ ४	ame)	2mh	:.qiup	3 pailli	ם ו
Depth: 14.51	[6]O		·			633		7 F :15		
100-11 (903 888)	W.69.	201	hali	बंद १०	स्या द्व	-[22 6 4 3	ەي	አዕ ለ -	:0)E	a l
ice Elevation: Surva-v	Suna									
LE BOKEHOLE LOG PAGE ZO	TOCK 2L	ECHNO	L TV.	C . VENJ	KUNI	TANT	7121	צ גודי/	V OV	, I
		يك حسب	w XV.		SOM	LLVV5	1 2:T.	7' LA X	CCK	I K

7	1
7	در

Date	ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG Borehole Number: P38-086 Location - North: East: Surface Elevation: For Area: 900-11 903 Pall Date: 3/24/05 & 3/24/05 & 3/28/05 Total Depth: Company: URS Project No.: GRZIO100 Drilling Equip.: Layor Devetro Africool Sample Type: Sofit Spoon RMRS LOGGING SUPERVISOR														
RMI APP			ING S	SUPE	RVISC	OR	<u> </u>			DATE					
, ,	OF OF INTERVAL	# X E	SAMPLE	FRACTURE	BEDOING	GRAIN BIZE DISTRIBUTION	USCS	DEPTH IN	SOIL LITHOLOGIC LOG	SAMPLE DESCRIPTION					
		0.6/10					GC		C HILL	EDWI wall reverse circulation generican Orilled 9-18 Ftd of no sempling, twenter about to air! Clayer graval, 17 Siery 104a7/2 course, poorly staded, subround, wet # [18-22 Dual wall saverse are - rio sample - cuffings as above. Stop for day at 22'] 24-26 silly weethered soltstone (Split Spoon push); grey file material prof greding:					
NOTES	S: Ge	meral:	uscs	is mod	ified for	r this lo	CV g as k	ollows:		Weethered; but some sends girls etop — collect 24-24.5 699 29 2bove bidrock (1938-866) — collect 24.5-26 Bs wishard bedrock (-C86D) Procedure No. RMRS/OPS-PRO.101					

(1) Badly broken core, accurate lootage measurements not possible.

Date effective: 12/31/98 Page 27 of 28

(2) Core breaks cannot be matched, accurate footage measurements not possible.

			GING:	`			AT -1	000		Company: VRG Project No.: Sample Type:
		VAL								DATE
ž	a	, ¥8, ±	, E	y	0	μŽ		Ī	٧	
N BOR	TOPROT	FEET OF CI	SAMPLE NUMBER	FRACTURE	BEDDING	GRAIN SIZE DISTRIBUTION	USCS	2 DEPTH	SOLU LITHOLOGIC LOG	SAMPLE DESCRIPTION
•								01		26-28 Split Spoon prsh
						j.	CL	-		weathered diffisione; grey
			-					-18-		pool grading dry; no clear
					·					bedding; low plastre; dry
	,				`					(26-27' c+38-086 & 5 4/5/05)
										JD-58.
	ļ .							_		
		٠.	·			·				
		٠.					٠.			
		į.				·		-		
					·					
			·		Ī	İ		_		
										XXXI
				Ī						•••
								`)
			:	.			ł		·	
				·		ŀ				
						h				
				•				_		
							, [
			,	.	<u> </u>		ŀ		}	
								- 4		

(1) Badly broken core, accurate tootage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

(401 1-430-0134/430)(Form GT.IA)(03/01/92)

Date effective: 12/31/98

	R	OCI	CY F	LATS	ENVI	RON	MENT	[AL]	ECHNO	LOG	Y SITE BOREHOLE LOG PAGE / OF S
	Вс	preho	de Nu	mber:	CP:	8-08	7			,,	Surface Elevation: Survey
:	Lo	catio	n - No	outh: 🔫	Survey	ea_Ea	ist: <u>s</u>	urvey	red		Area: 900-4 (903 Pad)
			3-14.		/						Total Depth: 75'
į	Ge	eolog	IST:	A Pac	1500						
·	Dr	uung	Eduit	o.: _Ar	s Bw	ERRRO	BE G	(30.	TITAN		Company: URS Project No. GR210100 Sample Type: Ams Dure TURE
-			LOG OVA		SUPE	RVIS	OR				
ł		1_		EI .	7						DATE
	OF COPE OF COPE IN BOX	TOP/BOTTON OF	FEET OF COR	SAMPLE	FAACTURE	BEDDING	DISTRIBUTION	USCS	DEPTH IN	SOIL LITHOLOGIC LOG	SAMPLE DESCRIPTION
1		·		. .				GM	0	TIT	0.35 6
4			1	1	1			 '		111/6	0.3.0 Gravel, sand, sit clay mixture
ı	٠.		1	1.	i						soft, slightly moist, compacted
				1.						[[]]	grarel-subargular glzite 0.05in
				.						1111	9 9 ,
				1	1						
1						1 1					[Fill]
1	- 1	. •	ľ				- 1	- 1	_ 2_	1111	
			l ·	1			- 1	. [111.	
ı	- 1		1	1	1 1			1		1141	
1			ł		1 1	1	- 1			1-111	
1	- 1		1	3.0	1 1	1	- 1	GC	- 3	777	<i>30</i> -
	0			Vac				ا کو			Clayey Gravel with Sand
F	-	4.0	4.0	40			- 1	- 1			Gravel-poorly-graded, subangular
	. 1		•	В		.	- 1	<u> </u>	- 4-1		availate A subangular
1				VOC	1 1			L			quality 0.05 - 0.7 in, crushed
				'	1 1				7	//	Clay-stiff, slightly moist, 5-10%.
l		ı			ŀŀ			· -	- 5-12		Sand- L5% coanse subrounded
				İ			. 1		1		pinkish gray 7.54R6/2 to
		- 1					.	- -	12	//	1. brown 7.54R 6/4
		٠.		6.0		- :					11. DIOWN 1.5YR 6/4
	- 1	.				1		-	- 6//		
٠.			i		1				1	/	
		- 1			.		- 1	 	1		
		. 1					.			4/	
		. 1.		1							
. :		.		I	.	- I -		L			
· .		1.		•					7/		
8.0) 8	0 4	4.0						. q_\/		
	1	·].		- 1							· · · · · · · · · · · · · · · · · · ·
٠.]					L		1	
	1		- 1	- 1	. '	1	- 1		7%		
			-	- 1				<u> </u>	ا الله	//	
			[•			·		9	
			.					-			
_	. `		- 1		ı					21.	<u> </u>
_	_		بالسحد				£.::		Γ/	/	

NOTES: General: USCS is modified for this log as follows:

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Procedure No. RMRS/OPS-PRO.101

Revision 0

Date effective: 12/31/98

L G	ocal ate: eolo	tion -	No:	th: <u>Si</u> - 05 Pack	cco	<u>d</u> Ea	ist: _S	urre	TECHN yod Titan		SY SITE BOREHOLE LOG Surface Elevation: Survey Area: 400-4 (403 Pad) Total Depth: 15 Company: 485 Sample Type: Arts Dure 11	Project No. Can.				
		S LA		GING	SUPE	RVIS	OR				THE THE TURE					
OF CORE	TOP/BOTTOM	OF IMERVAL	IN INTERVAL	SAMPLE	FAACTURE	BEDDING	GRAIN SIZE DISTRIBUTION	USCS	OEPTH IN	SOU THOLOGIC	DATESAMPLE DES	CRIPTION				
2.6	12.	0 4	2	4.5 Voc.				GJ a	-12 -13 -15 -16 -17 -18		10-12 See above grading into Gravelly s Some alt. color dusky red lok 3/4 olk. green is hopay Refusal at 12!	5% ussgrave 5% ussgrave 5% more sand Gley 1 4/1				

NOTES: General: USCS is modified for this log as follows:

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Procedure No. RMRS/OPS-PRO.101

Revision 0

Date effective: 12/31/98

	٦ کر	/د
_	_	

_]	ROC	KY F	LA	TS I	NVI	RON	MEN	TAL 7	ECHN	OT OC	SY SITE BOREHOLE LOG PAGEOF
_				· · · ·		- U - L	187	, .		OLOG	Y SITE BOREHOLE LOG PAGEOF
, L	ocati	on - No 3/15	orth	:	4	Ea	ist:				Surface Elevation: Area: 96-9 (963 Pa D)
	Date: .	3/15	1/05	4	3/16	105	-			•	
	Seolo	gist: _								•	Total Depth:
` C	Orilling	Equip	p.: _	Ams	Pow a	-Burp	962	20 T.t			Company: URS Project No.: GR 2107 00
										· · ·	Sample Type: Ams Deal Tube
F	RMRS	S LOC	GI	NG S	SUPE	RVIŚ	OR	•		•	
A	PPR	OVA	L_								DATE
1	1,	w_	Ę		T		7	7	7		DATE
Ę	× ĮĒ.	₹8₹		<u> </u>	8	24	GRAIN SIZE DISTRIBUTION	ا م	Z	×	
P COR		FEET OF CO	<u> </u>	SAMPLE	FPACTURE ANGLE	BEDDING	ž į	USCS	0EP1H	SOIU LIFMOLOGIC	
Į Ž °	- ē	골Ш골	3	e Z	£ ,	= `	8 5	1 5	8	No X	SAMPLE DESCRIPTION
	1	1	╼┼		 .	 	 	-	20	<u> </u>	See 3/4/05 Boring log of CP38-087 for single decupling from B to 15/ 4 singles 1, BC
ı	1		- [ł	Λ /		1\ /	(Advenced by)
1	1					l	!	I\	L _	/ /L	[Adve-ced hollow stem ansers (414"10,
1			- 1			1	1	11/	•	7 V /	1 0/4 0D) at attact of a -
1		- 1						IYI	2	1 V	onsinct pour halo for a to a
1	I	1		- 1				ΙΛΙ	<u> </u>	7 Λ I	Pulled anjors & drive duel tube
1		1						[/ N	• •	I/Λ	sampler 7 will due trube
i			1	•				/ \f	- -	I/ \I	10,7.
-	22		-					<u> </u>	*	V	
i		1.5		1			1	\ /	12		22,0 - 23.5 NO RECOVERY
ı	1	1/	1	- 1	i	1	j	\		\	
·] ·		2.6	, [- 1	1	ſ		V	_	V	
1	1	1			ł	.		$\Lambda 1$		ΛΙ	
1	1	l		- 1	ı	- 1	l	/ \[_23	/ M	
1 .		1		- [- 1	- 1	. <i>Y</i>	<u> </u>		/ V	
			1	H	- 1			SWI	7	•	17 brownish gray 104R 6/2 to
	240	' 	A	- }	- 1		Ŀ	2		0	11 Grownish gray 104R 6/2 to
		0	$I \setminus$	ı				\sim T	-24-	7//	yellowish brown 104R 5/8, Fino, well-graded, subround quartete, with clay (210%), slightly most
/	 	40	II	١,	- 1	- [- 10	CL	ł		Fine well-see O. O 10 18 5/8,
[(215/05	V		•	- 1	j	Г	• 7		enertate 4 Subround
	V 28		1	ł		- 1	į.		_ 1		Shelth and the clay (210%)
	France 3	1.	V	İ				_ F	-25-1		slightly most
	T	12.5		- 1	·	1	.]	j	I.		No excord 24-28' END OF DAY 3/15/05
l \1		3/405	1/			- 1	.	-	·		Sliglos purper hat dut the rals in awary
i \I	26.4	143	ľ	-	. 1	- 1	·				1 1012 R 1131 24 40 17 3.0 00
			ł	- [ľ			-26	44	yellowish brown 104e \$14, soft, moist. of fire state some!
		2.2		ľ				<u> </u>	$\cdot \cdot \cdot \cdot V$	7 /	yellowish brown 104684, soft,
		1			ł		-10	SCH	1/2	//	MOIST. M TIME ETRITE SAWE!
ı		40	26	ون ا		- 1			` 19		Yellowish brown 1042 5/20 fine, Subround, poorly gradel sterte, 3115hty weist Cinthue?
			M	1		j		-	-27 [valle it stayey stand
. 1	.		ער	_	-						removish from 104R 5/6, fine
1	1	ı	27	स	- 1			7		77	Subsound, poorly gradal stets
	1		E			ı		2	[v		3113Mily wrist Lingher?])
ł	ı	ł					- ~	~ -	28-1	1	11 - 68 2: Clay 1, 9 my, 54 5/1,
~		2	27,	۱ ا		ŀ	+	7			TWEATHER SIGHTLY MOIST - Englace?]
	- 1	37		.1		.	- [\	/ <u> -</u>	1	Λ	282-30 O'TD BEDROCKET
1		·		٠.].	-		\	V I	1/	(71	27.4-28.2 Clay Gray 545/1) YOUT ST. FT SIGHTY MOUST - [In place ?] (WEATHER = 0) BEDROCKE] NO RECOVERY
- 1					.			ΛL	29_	γI	1. Vacoviali
- 1	ļ	j		١.	- 1		- 1/		~! ¬	ΛΙ	ſ
1	İ	j		1		- 1	- [/	M	1/	'\	I
1.		.		1		-	- [/	T	7/	\	
	30.0								22 //		30.0 T.D.
NOTE	S: Ge	neral:	usc	 -> ≥ is	nodife	d for th	ie las	20 6-11-	シレ "		
_	Ma	aterials	amo	ounts:	are est	timated	by % u	as 10llot Koluma	NS; instantint	04	Procedure No. RMRS/OPS-PRO.101

stimated by % volume instead of % weight.

Revision 0

(1) Badly broken core, accurate footage measurements not possible.

Date effective: 12/31/98

(2) Core breaks cannot be matched, accurate footage measurements not possible.

	Lo Da Ge	cation te: ologi:	stZ	nth: 16 P38 Tu	19130 - 09 ta	-6 Ea	st 2	Surface Elevation: Survey Area: 100-11 (103 Pad) Total Depth: Company: URS Project No.: GR210100				
-	RA	1RS		GING	SUPE			620	TITAN		Sample Type: And Dune Ture	
TOPROTTON	OF CORE	TOP/SOTTOM	IN THE TOWN	SAMPLE	PACTURE	BEDDING	OFAN SIZE DISTREUTION	USCS	DEPTH IN	LITHOLOGIC	SAMPLE DESCRIPTION	
	・ 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一	4.0	4.0/4.0	33 A				F, L, SW	- 2 - 3 - 4 5 7 8 1		BEGIN 1207 0-3.4 3.4-8.0 Sandy gravel w/ clay coarse, subrown poorly gradely dionte/2tarte, dry, strong brown 7.5 MR 4/6 8.0-12.0 Sandy gravel w/ clay, as above	
N	OTE	L S: Ge	nerat	uscs	is modi	Fied for 1	this log	as folk	ows:		Procedure No. RMRS/OPS-PRO:101	

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0



Bo Lo Da Go Dr	oreholocation ate: eologi illing (e Nun 1 - Nor 3 / 0 st: _Z =quip.	th: 24 05 Tu: Ams	191 30 194 30 1900	38 0.6 Ea	15t: 20	86	-088	Surface Elevation: Area: 100-11 (103 Pad) Total Depth: Company: URS Sample Type: Ams Dune Tube DATE					
TOPPOTTOM SOC POS MAGNI	TOP/BOTTOM OF	PEET OF CORE	SAMPLE	FRACTURE	STEATY	GRAIN SIZE DISTRBUTION	USCS	- 06PTH IN	LITHOLOGIC					
\$ P. P. P. P. P. P. P. P. P. P. P. P. P.	12.0	72/2 2/2	13.4 () () () () () () () () () (USA				- 10 - 11 - 13 - 13 - 16 - 17 - 19 - 19		-12.0: -14.40 Clayery gravel with Sand, light olive gray 546/2, mother with yellowish brown 1048 5/8, coace, poorly graded, subround, slightly moist. [Refusel et 14,4 ft, offset 5' od, Birhel solid pt to 12', simpler from 12' 14.6-16-0 Sandy gravil with clay, yellowish rad 548 to brownsh yellow 1048 6/6, coarse, subround, poorly graded, slightly moist. -10:0-18.1 Sandy clay, Olive gray, 54 4/2, yery stiff, slightly moist.				
NOT	FC. 0					- 44-1	· · · · · · ·	- 20		Procedure No. PMPS/OPS-PRO:101				

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate lootage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

1.4	7

R	ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG Borehole Number: C138-088 Surface Elevation:											
Bo	rehole :ation	Num	ber: _	<u>.Cr.3</u>	<u>8 -0</u>	88 st:		Surface Elevation:				
Da	zauon le:	3/30	105		cas	». —			Area: <u>900~1/ 903 Roll</u> Total Depth:			
Ge	ologis	t:	$z \tau$	MA					• (Company: URS Project No.: GRZ10100		
				4 Dr			18-100	<u> </u>		Sample Type: Split-Span		
9	RMRS LOGGING SUPERVISOR APPROVAL											
AP	PRO	VAL					<u> </u>		DATE			
E S S	STOW VAL	ENERGY EN	SAMPLE	2 3	BEDOING	GRAIN BIZE DISTAIBUTION	ខ្លួ	PTH S	S C			
04 CO 08 N	TOP/BOT OF INTERV	IN IN IN IN IN IN IN IN IN IN IN IN IN I	35	FRACTURE	물목	90 S	USCS SYMBOL	DEPTH	SOIL/ LITHOLOGIA LOG	SAMPLE DESCRIPTION		
-		3	-	1		<u> </u>	 	20-	-	Begin 3/30/05 0827		
		1	ł			l	· .		1	Advised influit sandon via dustrially Foreign - Circulation periodian drilling from 0 to 21 ft (grave) practions), thou simple as indicated below.		
! .	٠.						i		1	0 to 21 ft (grove) for cuttinos), those simple		
	21.0	- ,	-				ļ	-21-				
	•	03		:			GP		-6	strong brown 7.5 4R 578,		
	21.8	(0·8)			·			_	~~ 6	se poerly graded Subround		
	22.0	X		. ,			\times	-22-	\boxtimes	21.8-22.0 Th guarte te.		
		1.9		N.		• .)	GP	,		22.0-23.0 Sondy gravel my clar.		
		1.0			1	·				as above		
	23.0		53.0		·.			_ 23	<u> </u>	23.0~ 53.7 < 1		
	23.0	17	F				GP	-0	•	23.0 - 23.7 Sundy gravel up clay, as above.		
	ĺ	2.0.	23.7		i	``. 				·		
· ·	ı		F				cı	-24		mottled rellarish brown 10485/8,		
·	İ	•	24.1	: . I	·	.]				stiff, mgist "1048578,		
									·	Stiff, moist Tour 1048578, [Weatheral Bulrock]		
]]		-25-		1-24.1-25.0 TD NORELOVERY		
	25.0	TO			ľ		- 1					
	.]	٠.						⊸ ∵⊣				
,	·	. 1				/			1			
			1									
	. 1						•	- -	. 1			
	·. 1		[·	İ	l	.		.			
		į	·	.	.]		I		ŀ			
		···]	j	1	ŀ	ľ	·		. [
1		•	4			ا الادراد و . ا	ordered to	· ·	. ;			
			İ			ł						
. !	. 1			· • • • • • • • • • • • • • • • • • • •	1		: 	_	, .			
·.	1			•	-		;	1		and the second of the second o		
	- 1				- }		ŀ		.			
			-	1	- 1							
	·		· .	1			.	l				
NOTE	S: Ge	meral:	USCS	is mod	ified for	this lo	or as fo	lows:		Procedure No. RMRS/OPS-PRO.101		

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate tootage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0



	ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG Borehole Number: C138~089 Surface Elevation: Survey Location - North: 749137. 9 East: 285841 Area: 900 - 1/ 903 R.U												
Lo	cation	- Norti	1: <u>74</u> 9	137.	_ Eas	t: 200	584	Area: 900 -1/ 903 P.U					
Da	te: <u> </u>	1000	<u>5</u>	174		<u> </u>		. :	Total Depth: Project No.: GR210 100				
Dri	lling E	quip.:	Ams	Pa	ER.PY	UBE	9620		Sample Type: Ans Durk Tube				
RMRS LOGGING SUPERVISOR APPROVAL DATE													
<u> ^'</u>	1,10	w_ £				Z	1						
TOP/BOTTON OF CORE IN BOX	TOP/BOTTON OF INTERVAL	FEET OF COF ININTERVA (FIELD MEASUREMEI	SAMPLE	FRACTURE	BEDDING	GRAIN SIZE DISTRIBUTION	USCS	DEPTH IN	SOIU LITHOLOGIC LOG	SAMPLE DESCRIPTION			
		3.2 4.0	3.0 A 4.0				FILL SW			0-3.0 Gravelly send, dark brown 104R 8/3 finer coarse, well-staded, subround, quarte, slightly moist. [FILL] 3.0-40 Gravelly silt, very pelibrown 104R 8/4, styst soft, slightly moest, we coarse subround gteite grand 4.0-10.5 Silty gravel of sand, pinkish gray 7.5 4R 7/2, coarse, poorly graded, subround dry.			
		4.0						-7- -8- -9-	000000	Procedure No. RMRS/OPS-PRO.101			

Materials amounts are estimated by % volume instead of % weight.

- (1) Badly broken core, accurate footage measurements not possible.
- (2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

Date effective: 12/31/98

19 H

Bo Lo Da Ga Dr	oreholocation te: eologic illing E	e Nui - No 3/11 st: _2 quip		C137	8-C ·9 Ea) 89 st. <u>20</u>)BE	8584	TISAL		Surface Elevation: Survey Area: 100-11 (103 Pad) Total Depth: Project No.: GRZ10100 Sample Type: AMS DUAL TUBE
	MRS I		GING	SUPE	RVISO	OR		·		DATE
TOP/BOTTOM OF CORE	TOP/BOTTOM OF INTERVAL	PRET OF CORE IN INTERVAL (PIELO	MEASUREMENT SAMPLE NUMBER	FRACTURE	BEDDING	GPAIN SIZE DISTRIBUTION	USCS	DEPTH IN FEET	FOIL LITHOLOGIC	SAMPLE DESCRIPTION
		3.8 4.0 2.0 2.0	(7.0 C				GM CL	-11- -12- -13- -14- -15- -16- -17- -18-		10.5-13.3 Sandy clay with gravel, Olive gray 275 546/2, mottlood by yellowish brain 10485/6, Nory stiff, with fine sand, 972 m/ Fine to coarse gravel, grante, slightly moist. 13.3-15.1 Etayof gravel of sightly moist. 13.3-15.1 Etayof gravel of sightly moist. 15.1-18.0 Sandy clay, dive gray yellowish red 548, 5/6, slightly moist. 15.1-18.0 Sandy clay, dive gray 546/2 mottled with pellowish brown 10485/6, very stiff, with Fine gto Sand, slightly moist. W/ sparse, fine gravel Angular fragments of black carbone coops material 24 17, up to 5 mm mex dimension. [Refusal at 18 ft, offset 5' W. push solid of to refusal at 8.8 ft, & samplar to refusal at 18.0 ft.
	<u></u> L								 -	

NOTES: General: USCS is modified for this log as follows:

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate lootage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Procedure No. RMRS/OPS-PRO.101

Revision 0.

Date effective: 12/31/98

Date effective: 12/31/98 Page 27 of 28

176	Lo Da	catior ate:	3-29	th: -05	·	RONN 8- Ea	St:	ALT	TECHNO		Y SITE BOREHOLE LOG PAGE 1_ OF 1 Surface Elevation; Area: 900-11 (903 fa. 2) Total Depth: 24-5
	. Dr	eologi illing l	st: <u> </u>	-Tuta : Layon	AR	- 1000)				Company: URS Project No.: GR240100 Sample Type: 4017-5000
		MRS PPRO		SING !	SUPE	RVIS(OR			1	DATE
uřy	ž	<u>5</u>	# # # # # # # # # # # # # # # # # # #	£	w	T.,	MŠ		2	J	
	E 60 50 N	10P/80T	FEET OF O	SAMPL	FRACTUR	BEDOING	OPAN BIZE DISTRIBUTION	USCS	DEPTH FEET	SOIL/ LITHOLOGIC LOG	SAMPLE DESCRIPTION Begin 3/29/05 1043
		17.0	070					GP	19 —	X	Aborned thout sampling. dunt-wall response circulation former per cuttings from oto 19 19.0 - 14. 85 Sand
		19.79	0.75	, ,				S .	 - 20-		120.0-20.5 Sendy stard worst,
		20.5			,	·		X 30	_ 2(_	X	- 21.0 - 21.7 Sandy gravely clay, as above
	•	21.7	0.7	21.5 D		ř		GP	22	8	-22.2.25 Sandy gravel my clay,
			2.0	22.5 E 23.5				CL	23		mottled with yellowish brown 1048/8; St: FF, wet. [Ux Dedrock]
		•	100	L				X	— 24— —		23-24 Clay, as above [Wx Bed Cock]
		24.5	77						<u> </u>	<i>(</i>)	
				* -2		-	5 - L				
								. -			
	NOTE	M. (1	aterials) Badly	/ broken	ts are e core, a	estimate accurate	d by %	volun	ne instead asurement	e not no	Procedure No. RMRS/OPS-PRO.101 light. Revision 0 ssible. Date effective: 12/31/98 ements not possible.

(40) 1-930-0134/930)(Form GT.LA)(03/01-92)

Date effective: 12/31/98 Page 27 of 28



1	RO	CK	YFL	ATS	ENVI	RONI	MENT	CAL 7	TECHNO	LOG	Y SITE BOREHOLE LOG PAGE 1 OF 3
1.	Bore	hole	Nui No	mber: ab 7	<u>CP</u>	38 -	st: 24	0	 		Surface Elevation: Survey Area: 900-11 (903 Pad)
	Date	3	3//€	105	<u> </u>			300			Total Depth:
1	Geol	ogis	t2	105	<u> </u>	N.				•	Company: URS Project No.: GR 210100
	Drillio	ng E	quip	<u>A</u> m	s you	ERPR	OBC	462€	TITAN		Sample Type: AMC DUAL TUBE
					SUPE	RVIS	OR		•		
	APP	RO	VAL					<u> </u>	DATE		
₹,	Į	_ 	## 280 280			8	H S		Z	ğ	
ě		8			PACIU	A BOOK	GAMM SIZE NST REUTION	ENABOR.	1 E	5 5 8	SAMPLE DESCRIPTION
Ď	, <u> </u>	<u> </u>	E E	<u> </u>			ă		•	Ē	Begin 0820
1	- 1		2.9	1			F			0.1	0-3.3 Gravelly sand
			· /	1			[1]		 -	, ,	dark brown, 10423/3;
1.	1	•	4.0			•	L			,	Fine- Goarse, well-scaleD
				ŀ	1.		Ľ		- ' -	٠,	Subrand quertz slights.
	- '			1				·	- -		Moist- [FILL]
	1.	·	•				Sw			•	
ľ	1	۱ :	٠.,					· .	2		
	1.		· . *			. :				a	
	1		•		1						
		- 1		3.3	(35)				_ 3 _	٠,	
1	1.			A	A						3.3-8.0 Sandy source we chy
				17	0		GP	ľ		a	light gray 7.5 4R +5 7/1 to
	4.			700					- 4 -		light brown 7542 6/4
	1		4.0	V	1			- 1		4	Coarse poorly graded, subround
			4.0	0						•	querte te dry.
	.						.	- 1		-	
							1		_	. 0	
	1.0		`	6.0					. 6	•	
		5						ŀ		20	
								L	_ , _]	4	
).							_/ _	0	artini di Salah da Salah da Salah da Salah da Salah da Salah da Salah da Salah da Salah da Salah da Salah da S
	1	1						-			
							*****************	tigas er ja e.		٠. [- 8.0-9.8 Sendy stavel wy clay,
	8.0	7	4.0				oo T	. [0	á	As above
			/			- [6	28	-	. 4		
			4.0							•	
		1	·		·				- 1 -		
		.	ļ					 -	. 4.	6	
		\perp					56	<u>.</u>	· -	0	. 9.8 [see nort pise]
NO	TES:	Gen	erat	USCS	is modi	fied for	this log	as fol	lows:		Procedure No. RMRS/OPS-PRO:101
		Ma	terials	amou	nts are e	estimate	d by %	volum	e instead o	1 % wei	ght. Revision 0

(1) Badly broken core, accurate footage measurements not possible.
(2) Core breaks cannot be matched, accurate footage measurements not possible.

APPROVAL DATE DA	2 OF 5
yellowish red 54R 5/6; medium, subangular poorly graded, gtz/fold slightly moist, by some silt/clay (2100%) 11.3-13.0 Sandy sravel with che Yellow 104R 8/6 to reddish yellow 75 4R 6/6 Coarse, poorly graded, quartzite, dry.	
13. Sandy sravel with che yellow 104R 8/6 to reddish yellow 7.5 4R 6/6 Coarse goorly graded, quartzite, dry.	Osfer,
16.0-18.5 Sandy snevel with a light say 2.5 x 7/2 (serse, poorly snevel with a strong	Subround,

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

Da	cation le: <u>}</u> clocis	• Nort 1 0 5	SVI Azte	VOYED 3/	Eas	si; <u>su</u>	ITA		` '	Y SITE BOREHOLE LOG PAGE 3 of 3 Surlace Elevation: Surveyed Area: 903 Pnd Total Depth: 24.0 Ff Company: URS Project No.: GR210100 Sample Type: Dual Tube
RA		.OGG			EVISO		77.			
1,00	1	MA E				-8	_		 -	DATE
POSTON SOCIAL SOCIAL	TOPPOT SO SO SO SO SO SO SO SO SO SO SO SO SO	PEET OF CO.	2007	PACTU	JOH	ORAM SUB DISTRACTION	USCS Syldon	THE STATE OF	SOIL LITERATOR	SAMPLE DESCRIPTION
		2.3					X		V	20-21 NO RECOVERY
	·	4.0	21.0 C	-			oc	=2(-		21-22 Clayer grave / my soul as above 18.5-20.0.
			22.0					-22-		,
			D 23.0			_	CL			54 41, mothed with Itolive brown 2.54 5/6, vary st. Ff, moist.
		.•	23.0		·					23.3 27 NO RECOVERY
·	24-0	P						- 4-		- 24.0 T.D.
				·						
									7	
					: .				. 1	
									.:	
	`nup:									
								- <u>-</u>		
NOT	N (*	laterial: I) Badi	amoui y broke	nts are n core,	accura	led by !	% volut age me	ne instead asurement	s hot p	

ROCKY FLATS EN	NVIRONMENTAL TECHNO	PLOGY SITE BOREHOLE LOG PAGE / OF
Location - North: Sun Date: 2-28-05	raged East: Surveyed	
Geologist: A. Pache	V	Area: 903 Pad Total Depth: 18.0 fr
Drilling Equip.: Powe	r Prote	Company: Up.
RMRS LOGGING ST	IPERVISOR	Sample Type: Dual Tabe Project No.:
APPROVAL	or Dick 190K	
3 3 5 5	. I Taki T	DATE
TOTAL TOTAL	OB O	SAMPLE DESCRIPTION
	GM	0-3.2 Sand-silt- clay mixture Dark reddish brown 5YR 3/4 poorly-graded, subangular quartzite and granite (0.05in) dry [Fill]
3.2 A VOC 4.5 B VOC	GC -3 - 4 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5	3.2-4.2 Clayey Gravel Lt. reddish brown 5YR 6/4 poorhy-graded, su bangular quartzite (0.1.in) 5tiff, dry 4.2-4.4 Clayey Sand Ak. greenish gray Gley 1 4/1 fine, subrounded, dry 4.4-7.5 Clayey Gravel as above
6.5		
Amposite discreen	-8 - -8 -	
	-9 - -0	
(1) Badly broken com	odified for this log as follows: e pstimated by % volume instead of % e, accurate footage measurements not be matched, accurate footage mea	

Page 27 of 28

14011-910-0134-9109Farm GT, 143903/01-923

	ROCI: Soreho	CY FI le Nu	ATS E	CHVIII	RONN	TENT	TAL 7	TECHNO	roc	Y SITE BOREHOLE LOG PAGE 2 OF 3
1 1	.ocatio	n - No	rth:	rrege	<u>L</u> Ea	डा: झ	reye	7	•	Surface Elevation: Surveyed Area: 903 Pad
		2-28. ISI: 1	Pad	1000				······		Total Depth: 18.0 Ct
	Oritting	Equip	: _P	ower	pabo				i	Company: URS
			GING :						+	Sample Type:
1	PPR	DVAL	O1110 .	SOFE	V Å19(JK			•	
-	7,	79-4	Ę	T	7	T 2	-	7	÷	DATE
TONOTO OF CON	TONOTO S	FEET OF CO. IN WHITE PARA	SAMPLE	FACTURE	PEOSIO PEOSIO	CANAN SIZE CATAMORTES	SYME	M HISO.	SOLUTION TO TOO	SAMPLE DESCRIPTION
				7			GC.			Clayey Gravel as above 10.5-11.0 Less Gravel
11.5	11.0	4.0					a	-/-		grading into 11.0 Gravelly Clay
			10-16,					-/2-	///.	12.0-12.5 Crushed Gravel
										quartzite, gray 7.54R 6/1, subangular 12.5-13.0 Gravelly Clay reddish brown 54R 4/4
			8 screen		· ·			-13-		13.0 less gravel, grading into clay
l	 		composite					- ,4		14.2 (1-1-1)
14.5	14.5	4.0	200							14.2 Gravel, quantzite (0.1 in), subangular dark gray 7.5 YR 4/1 14.3-16.0 Gravelly Clay
								-»- 		brown 7.5 yr 4/4
	·						}	-16-		16.0 Gravel, quantzite (0.1 in), subangular dark gray 7.5 XR 4/1
			VOC		٠	- 1		7	//	16.1-17.0 Gravely Clay
			2	- 1	- 1	ŀ		- 17-1	4	16.9 Same as above withgravel
			NOC					[1]	444:	-17.0 Silty Sandstone
180	18.0	0 0			- 1			1		dark reddish brown 2.51/2 3/4 to
	10.0	3.5	1	- 1		-	\dashv	- 18-11	111	brown 7.5xR4/4 to pale red
		1		- 1	- 1				1	2.54R7/2
									.	LTD=18.0'
			.				1	-/7		Gamma screen of composite
				1			H	٠. ٦		American. Excess cuttings permitted
				╌┸	سإس			20	1	to go back in hole.
NOT	M	alerials	USCS I	s are be	stimate	d by %	volum	e instead of	% wei	Procedure No. RMRS/OPS-PRO.101
	(1) Badiy	broken	core, la	ccurate	footac	e mea	surements i	not no	gnt. Revision 0 rable. Date effective: 12/31/98 ments not possible.
	. ,-	, - 5.5		it iob e	- inaic	~ 100, A	-corate	novada w	PESUIC	menu not possible.

1	RO	CK	Y FI	ATS	CNVI	PONT	A 100 har			-	FORM PRO.101/	1
	Loca	ation	Nur - No 2-28	rth: <u>-S</u> y	CP39	-059 4_Ea	st: S	AL T	ECHNO d	LOG	GY SITE BOREHOLE LOG PAGE / OF Surface Elevation: Surveyed Area: 903 Pa d	2
1	Geo	logis	1: <u>-</u> 7	Pack	eco				 .	2	Total Depth: 18.0.ff	
-				Por	-					:	Sample Type: Dual Tube Project No.:	
	RM	RS L	.OG(SING	SUPE	RVIS	OR					=
	API	HO	VAL								DATE	
1	K 8	Ē≱	889	3 = 5	18.	24	H S	- 8	2	l w		=
Torse			PEET OF	The state of	FACTU	\$ §	CHAMBUTO CHETTEROTIO	System	8.5 F.2	100 B	SAMPLE DESCRIPTION	
	1							GM			0-3.2 Sand-silt- clay mixture Dark reddish brown 54R 3/4	-
	1.				1	1	•				poory-gradua, subangular	- 1
	-			1]				_ / _	111	quartzite and granite (0.05in)	ı
1	.				1			·		111	dry [Fill]	- 1
1	1			1					_,_	111	LEINS	- 1
	-			1						Ш		- 1
1		J								4411	1.	- 1
ı	1			3.2					<u>_3</u> _	Ш	1	
				Avoc			- 1	GC		1	3.2-4.2 Clayey Gravel	- 1
4.0	, 4	.0	4.0	VOC			- 1	ا ت			Lt. reddish brown 5 YR 6/4	- 1
	+	. •	7.0				1	\rightarrow	-4-		poorhy-graded, su kangular quartzite (o.lin)	
·		- 1		4.5	1	1	l	SC	_ [Stiff, ary	
				B		- 1	- 1	GC	7		dk.greenishgray Gley 1 41	-1
	1	- {		٧٥٢	ŀ		- 1	ŀ	-s-	†]]]	Tine, subcounded, dry	
	1	- 1			- 1		- 1	Į.	- 4	11]]	4.4-7.5 Clayey Gravel as above	.
	1				.	.	ŀ	j				- 1
	1			, ,	- 1	.	1		-6-	111	·	
	1	- [6.5	. 1	.	- 1		• 4			
	1	- 1			l	- 1	- 1		_ '			
7.5	17	5	, .	5		- 1	- 1	Γ	-/-			
••	1"	7		d'Sereen		ſ		-	· -네			
				. 1		- 1	- 1	L	الـــــــــــــــــــــــــــــــــــــ	111		
				Composite 0-10						111		
		-	- {	٩	j	ł	ı	. -	· 11	Ш		
				9].	- 1	- }	L	-9			
	1			· }				1	'	╢	•	
				- 1	- 1.	1		卜	. 41			
					<u></u>				10	1		
NOI	rES:	Gen	orat; eriale	USCS I	s modii	fied for t	his log	as folio	ows: Instead of		Procedure No. RMRS/OPS-PRO.10	
		(1) (Decil	proxen	Core, la	CCUTAIG	foota c	ia mas	tillamante i		see blo	
		(2)	cone i	oceaks (toning	po witt	chod, a	ccurate	tootage m	Pasure	rements not possible. Date effective: 12/31/99 Page 27 of 2	
					-							

1 1	ROCK	Y FL	ats 1	ENVI	RON	MENT	PAR *			FORM PRO.	1014
E	Borehol	e Nun	ber:	CP39	-059		AL	RCHNO)Lp(GY SITE BOREHOLE LOG PAGE	2 of 3
1 ~		1 - 1401	ער": "א	rvege	Æ₽	st: <u>ક</u>	irreye	7		GUITAGE EIGNATION: SHEWAY	- v
, -)ale: <u>_2</u> Seologi	20-					· ·			NO. TOTAL	
	rilling (Si. <u>Zi</u> Eguio:	.1 88 P.	1600	22/				:	Company	
1									!	Sample Type:	
R	MRS	LOGC	ING :	SUPE	RVIS	OR	-		•	W. LODE	
	PPRC	VAL				<u> </u>			1 2	6 4 5 5 5	
8.	Į,	88				- K	T-		\vdash	DATE	
98	80	SES C	. E. E.	A Part	NO.	Oran SIZ	2 2	3.5	۱. ğ.		
89.	18 3	52.3	. 3 3	1 \$ 4	84	36	3 2	A 123	E S	SAMPLE DESCRIPTION	i
	1	<u> </u>	 	-	 		 		5	J. J. J. J. J. J. J. J. J. J. J. J. J. J	
İ	ł	l		,	į	1	GC		114	Clayey Gravel as above	·
1	1	1			j	1	1	⊬.⊣	166	10.5-11.0 Less Graves	
l	1.	ĺ					6			grading into	
11.5	 	.,]							14/	11.0 Gravelly Clay	
11:3	115	4.0	. 1				CL		"//] .	
ŧ			-18	<u> </u>	•			7	///		1
			6	. 1		1		-/2-	//.	12.0-12.5 Crushed Gravel	ł
	ĺĺ			- 1	1	1	j	F		avaitzite army zevokli anhan	
		l	Screen	i		ŀ	.			gvartzite, gray 7.54R 6/1, sabang 12.5-13.0 Gravelly Clay	juar
		. [5	1	.	- {	L	_/2_		TERRIOR DEBRUS SVD 111.1	ŀ
		- 1	2	- 1	.	i	i		//	13.0 less gravel, grading into clay	ł
					- 1	- 1		- 4	//	3 75 9 mc say	1
		- 1	1	1	:]	ļ					- 1
	,,, <u> </u>	., . [mposite		•		ŀ	74-1	//	.u	i
77.5	14.5	7.0	6	1	- 1	ı	L	.]	//	14.2 Gravel, quantzite (0.1 in), subar	gular
i	- 1	- 1	0	Ì	- 1			7/		I want girly holled	⁻
.		- 1		- 1	- 1	1	-	-15-1		-14.3-16.0 Gravelly Clay .	.
i		- 1	- 1	- 1						brown 7.5 yr 4/4	1
ı	ł	1		1.			_ <u> </u>				
- 1	- 1	l			- 1	- 1	L	-16-1			į
I		- 1	ı	. ∤.	- 1	- 1			/h	16.0 Gravel, quartite (0.11in), suban	gular
- [- 1	1		- .	- [- 1	-	-1/2	//\	dark gray 7.5 x R 4/1	
	1	Ľ	200		j	- 1.	<u> </u>	13		16.1-17.0 Gravelly Clay	- 1
- 1	- 1	2	oc l	1			_	- 17 	份 /	6.9 Same as above with gravel	J
	.	Ľ	~	- 1	- 1	- 1	L	113	}}}\	17.0 Silty Sandstone	. [
8.0 1	8.0 8	.s	- }		1	- 1	Γ	TH:	1:1	dark reddish brown 2.51/2 3/4 to	- 1
-		$\tilde{\dashv}$	- 1		ı	-		18-11	11	brown 7.5xR4/4 to pale red	
- 1	- 1	- 1		•		ı		, i	- []	2.54R7/2	
1		- 1 -		j		1.			-{\	•	
-		- 1		- 1]			_ .	1,	-TD=18.0'	-
I			- { ·				·	⁷⁷ ー・		Gamma screen of composite	j
- [- 1	-	-	-	- 1	- 1	·L	- :		samples resulted in Opplifg	
				1	1	- 1	Γ	. 7:		Americium. Excess cuttings pora.	ted
		-		-4-	l			20		Americian. Excess cuttings permit	_,
MOTES	: Gene Male	rat US dale a-	iCS is a	modifie	d for th	is log a	tollov	MS:			
	(1) B	adly br	oken e	are pst	maled Signal	Dy % v	olume i	instead of X trements no	welg	LA .	1
	(2) C	ore bre	aks ca	nnot be	match	od, ac	curate f	ootsoe mie:	i post	nents not possible. Date effective: 12/31	
<u>-</u>								3 a stde d		Pen 22	530

R	OCK	YFL	ATS	ENVI	Poin			-	-	FORM PRO.101A
В	oreho	e Nur	mber:	CP3	9 -06	men:	LYF.	TECHNO	LO	GY SITE BOREHOLE LOG PAGE OF
	_	110	IUI: 34	Arveyed	E	اعد: St	urvey	-d	:	Outland Elevation: Survey
_			Pach							ruea
l or	illina i	əı: <u>11</u> Equin	Poch	wer Pr	<u> </u>				:	Total Depth: 16.81 Company: VRS
			_			-			i	Sample Type: Deal Tribe
R	MRS	LOGO	GING	SUPE	RVIS	OR	-			, rese
AF	PRC)VAL	-		•	<u></u>			;	
3	3	. 22	E	T	T	T	1	7	<u> </u>	DATE
688	150	8		122	1 2 7	1 1 1	2 2	1	8	
895	8	F 25	3 3 3	12.8	100	S E	2 80	1.5	E 8	SAMPLE DESCRIPTION
-	-	= '	4	ļ	<u> </u>	- B		_ °.	5	SAMPLE DESCRIPTION
l		ı	1	1			6M		1,1	0-3.4
1	1	1			ı	[1			1
1		l	1		1	1	İ	• 7		Sand-silf-clay more with gravel
		I						-1-	111	Reddish brown SYR 4/3
		l	1					1 1	1.14	poolly-graded, sabangular gravels
		1		1 1				- -	17.1	granitic to quantzite (0.05 in)
		ĺ		1					11	1 'TERIUM, CULA, I I
								7	111	[Fill [Fill]
· 1				1 1				L _	11 ŀ	[Li W.)
- 1]	.			1		
- 1			3.4		.	- 1		-3 -		
. 1				1	.					2 4 61
4.0	4.	4.	8 voc				GC		//	3.4- Clayey Bravel with sand 7.5 pinkish white SYR 8/2
	1.0	10		1	: 1	- 1	- 1	_ , ' '!	//	in pinkish white SYR8/2
. [- 1	- 1	4.5	- 1			ſ	- 4 -		Stiff, sand-subsounded, medium, quantz
- 1	- 1	t	c	- 1	- 1	- 1	- 1		1	gravel-subangulu (0.11in), quantsite
- 1	- 1	ſ	ا ـ ا	J	- 1	- 1	- 1	. 7		Slightly would
- 1	I	ł	Ĉ	ŀ		- 1	ŀ	-s(/	19	
- 1	- 1	ł	to Local	- 1		- }	٠			[Alluvium]
	- 1		₹ 🖯	1		- 1	ı	/	1/1	
- 1	-1	6.4	230	. 1		- 1	L	_		
٠ ا	- 1	- 1	3	- 1.		- 1		٦,	/	grading into large assures
			0	- 1,			- 1	. <i>Y</i>	1	(0.11 0.15)
- 1	- 1	- 1	'fa	- 1	- 1	ŀ	- 1	1	1	grading into larger gravels (0.1 in - 0.15 in in length)
		- 1	Ö	- 1	i	•	H	-7-1/	1	onegular, granth
	- 1	. [compos			. 1	I	16	/	gray STRS/1
.0 E	n		8			ト		. 44	\mathcal{A}	7.5-8.0 No Recovery
~ °	<u>: ۲</u>	2			l	\vdash	Δ	/	\triangle	1
	-	- 1		.			c	- 8 - 7		8.0-12.0 same as 3.4-7.5 with
1	1		1	. [[16	L	1/	1	languagnavels as in ~ 6.75'
1	-	1	j		- 1		٠	1/		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1	- 1		1	1.	-1		. -	-9-12		
T	1	- }	· }	1	ľ	1	· .		/	1
1	1			1.	- {	- 1	H	- 4/	1	
	ــــــــــــــــــــــــــــــــــــــ					_		10 /	1	1
IOTES:	Gen	erat; U	SCS is	modific	d for #	de los			<u>-</u>	
	mau	inzis a	MOUNTS	are bs	imated	bu & .	arm dev	وأب بدرومول	K wal	Procedure No. RMRS/OPS-PRO.101
	,,,,	~~!} +	'I UNDIT (JUITE, VAC	CUITAIR I	YOO IS NOT	-			The state of the s
	(4)	~ 0 01	PERS C	mudot D	o matci	ned, ac	curate	tootage mie	asure	ments not possible. Date effective: 12/31/98

Da Ge Ori	cation te: ologis tling E	- No: 3-1- st: _£ quip.	th: 51	rveyed	_Ea	st: _5	TAL T	TECHNO	PLOG	Surface Elevation: Surveyed Area: 903 Pad Total Depth: 16.51: 16.8 Company: UKS Project No.: Sample Type: Dual Tube
		VAL							-	DATE
POSTON OF COME	ADT SO	PEET OF COME	SAUPLE SAUPLE MARREN	FANCTURE	PEOPPE THORY	CRAW SUE DESTRECTION	uscs smeon	יבניו	SOLU- LIRAGLODE	SAMPLE DESCRIPTION
155 16.5	ls.s	2.0	15.8 E				GC Cd	- 11 - 12 - 13 - 14 - 16 - 16 - 17 - 18 - 19 - 20		See abore 1.7-11.9 Staining Very DK-greenish gray Gley 2 3/1 Sandy Gavel 12-13.0 No Recovery coarse, subrounded Slough from above tracecley Soft, 13.0-14.0 Sandy Clay with slightly frace organics reddish brown 5YR 5H/yrdk. [Allinear] Poor by-graded, medium subrowcledish, 140-14.5 gravely Clay, 8 hkishgray 5YR 6/2 dkrytay 5YR 4/1; slightly noist 14.5-15.5 NoRecovery [Allindar] H-5-15.5 Norecovery [Allindar] Shormshardy 104R 6/2 dep 3-105 coarse-medium subrowned gravel of shift, slightly most, traced gravel of 16.3-16.5 5; thy Sandstone Neatherd (completely), mod. strong 11. brownish gray 104R 6/2 Neatherd (completely), mod. strong 11. brownish gray 104R 6/2
NOTE				is mod				lows:		Procedure No. RMRS/OPS-PRO.101

Date effective: 12/31/98 Page 27 of 28

Materials amounts are instimated by % volume instead of % weight.

(1) Badly broken core, taccurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

R	ОСК	Y FL	ATS	ENVII	ROM	A Property			-	FORM PRO.101A
,		e Nun 1 - Nor 3-/-0	אר. יתו	CP3	9-06 Ea	st: _S	ALT	TECHNO	LO	GY SITE BOREHOLE LOG PAGE 1 OF 2 Surface Elevation: Surveyed
G	eologi	st: <u>A</u>	Pache		++-				•	Area: 90.3 Pad Total Depth: 16.8
Dr	illing E	Equip.	Po	wapo	be				į	Company: URS
RI	MRS	LOGO	ing	SUPE	RVIS)P			+	Sample Type: Deal Tube Project No.:
AF	PRC	VAL			v Aist	JK			!	
3	12	2,		T	T -	T E	_			DATE
583	150	829	1 25	MOLE	187	1 1 2 6	2 2	3	8	
29.	\$ 5	25	. \$ 2	102	\$ \$	OAMA BUD	200	\$.5	1 2 3 3	SAMPLE DESCRIPTION
	1	<u> </u>	 	 	 	- 8	 -		5	LE DESCRIPTION
İ	1	1	'	l		ŀ	6M	j i	1	0-3.4
1 .	l	į	j]				┝ . ⊣		Sand-silf-da in in
	ŀ	•							114	Sand-silf-clay mothere with gravel
		·						,		Reddish brown SYR 4/3
								- 4	11.1	granistic to quantite (0.05 in)
										medium subar (0.05 in)
				·]						[Fill] slightly make quartz sand
·				1	J	ĺ], ˈ	
				- 1	: 1	- 1		_,	Ш	
	ı		3.4	i		ı	•	_, _		·
4.0		, .	8 VOC	- 1	- 1	Ī	SC		//.	3.4-Clayer Gravel with sand
1.0	4.0	70	- 1	- 1		- 1				113 Pinkish white 54R8/2
. 1	. 1		4.5	- 1	•	- !	ſ	-4- ₁		STIFF, Sand-subrounded, medium, quants
ı	Į.	t		- 1			ŀ	- 4		gravel-subangulu (0.11n), quantsite
ı		- 1	5	- 1	1	J	Į.		//	Slightly woust
	ı	- 1	٤	1			. [-s		[Alluvium]
	ł	ł	20			ı	-	· - //	//	
ł		6.0	37	. :					//	·
	ı		37					-6 - /		grading into large
	ł		0	- 1.			L	. <i>-</i>	9	Colin Olai
1	- [- 1	ta	- 1	j	. }	1	<i>y</i>	/-	grading into larger gravels (0.1 in - 0.15 in in length)
. .	- 1	·	200	ı	1	- 1	 	-7-1/	4	onngular, granztite
	- [- 1	sodwoo					6		1-7 3 1K 5/1
5.0 8	.0 3	5	Č				\times		X	7.5-8.0 No Recovery
			ł			· [-	7	-8-K	4	8.0-12 0 same as 21
	- 1	- [- 1	- 1	6	c.L		//	8.0-12.0 same as 3.4-7.5 with
Į	-	- 1		ł	ļ		٠ [7/		larguagnavels as in ~ 6-75'
	1		-	ŀ				-9-1/2		
• •	- [1	1	.	· 1	\cdot	ľ	/	
			- 1	ŀ	1	Ì		· 7/		
NOTES				 - -				10 /	7	
nu (£5)	Gene Male	orat U. Orale ad	SCS is mounte	modifie	od for th	ils log	is follo	Ws:		Procedure No. RMRS/OPS-PRO.101
	117	וע קונססי	UKONC	Ora. Dic	CHIRNES	Motore		instead of surements h		ght. Revision 0
	(2) C	Soue p ú	eaks ca	nuot p	o match	red, ac	curate	lootage me	asure	ments not possible. Date effective: 12/31/98
1-430-0134-4				-		<u> </u>			-	Page 27 of 28

R	OCK	YFL	ATS I	ENVI	RON	MPN	rar e			FORM PRO.101A
В	oreho	le Nun	nber:	C83	9-060))	ALT	ECHNO)FOC	SUITE BOREHOLE LOG PAGE 2 OF
, ~·		1 • Nor <u>3 - J - C</u>	นา: _ว×	rreyed	E	ist: s	urveye	1	•	Surface Elevation: Surveyed Area: 903 Pad
			Pach					 .	·	Total Depth: 16.5 16.8
Dr	illing (Equip.	P	venPo	obe.	-			:	Common 1646
D	MÓC	1000						·		Sample Type:
		DVAL	ING :	SUPE	RVIS	OR				
	THE	777								DATE
2 4 1		NE S	4.5	1 W	0	Mè		7	T	
8 8 8 8 8 8	89	NAME OF THE PERSON OF THE PERS	. 53	PACILE AND A	100	Oran sug	200	£.5	\$ 8 8	
5 0	12.	25.5	. 2	E .	* `	186	135	8.	1 5 2 2	SAMPLE DESCRIPTION
	į						1	 	, , ,	
		1	l			l	GC	l . :	///	seeabore
		}	•					. -	//	
	•					i .	1	L // L	11/	·
							1		/	·
	10 0	l	DVOC					- 4	//	Non Die
2.0	IZD	4.0	1.9		1				% /	1.7-11.9 Staining Very DK-greenish gray Gley 2 3/1 Sandy Grave
- 1	·							-12-1		
- 1		[- 1	1	- 1		\bigvee		VΙ	Slough from along guartz,
- 1	i	ı	- 1	j	.		Λ I	7	/\	trace clay
ı		- 1	1		. [Ħ	 Y	-13-4	Y	soft,
. 1	ŀ	- 1	•	1	.	ľ	CL	-		13.0 - 14.0 Sandy Clay with Slightly trace organics moist.
- 1	ı		- :	j		1	- 1			reddysh Latinana
- 1	- 1	- 1	- 1	- 1		į	1			reddish brown SYR SH/gray SYR . [Alluman poorly-graded medium subrounded sand,
- 1	i	i	į	İ		J	ſ	-/4/	19.0	4.0-14.5 gravelly clightly moist
- 1	ļ	- 1		- 1	- 1	k	 j.	. 4		dky tray SYR wills (8.11) grants to (1)
1	Į		- 1	- 1	- 1	ľ	$\backslash \Lambda$	N	\mathcal{M}	Pool by-graded, medium subroundeds and, 140-14.5 grants, slightly moist porthyroded. Clay sinkish may syr 6/2 porthyroded. Tgraves 6.1in) grants to subrounder 14.5-15.5 No Recovery [-Allman.] AP3-1-05
5/	5.5	20	1			1	Χŀ	-15-	XΙ	A-P37-05
- 1	23/6	4	- 1	- 1	- 1	Ľ		1/	' V	•
- 1		-	5.8	- 1.			L	· 1/2	7, T	15.5-16.3 Sanly Clay Collinson 11. brownish gray 1048 6/2 fallowing Coatse-medium subrounded grants sand 5.3-16.5 Silfy Sandstone Weatherd (completely), mod. strong 11. brownish gray 10486/2 D=16.8'
ł	- 1	E		- [-	- 1		L	-16-1	//	11. brownish gray 104/2 6/2 tallman]
5 16	2.5	1.0 16				L		12		stiff, slightly mout to
-1		TF		.	ı		. -	-41	HI '	weather diffy Sandstone
- 1	1	К	8	1		-	_		111	11. brownish grown (must), mod. strong
	- 1			1		-1	<u> </u>	- <i>n</i> -	7	D=16.8' 104K6/2
- 1	- 1		- 1	ł	ı	ł		1:	ŀ	
- [-	ł	- 1	Γ	7	1	
- [ł		- 1	- 1.	- 1		<u> </u>	-18 —	ł	
	- 1	1	j	- 1			- 1	" ;	1	
- [- 1		- 1		- 1	·	4	- [
- 1	- 1	- 1		- 1	1	- ['	.	1.	1	
	1		- 1	1.	-		<u> </u>	19—	-	.
	-	1	·	1.	1	-	\cdot	1:	- [i 1
-		-	-	- -	. 1		一	4	-	· .
								20	. }	1
)TES:	Gene	rat: US	SCS is	modifie	d for th	is log	e folks	.		December 21 To the control
	Mate	ing time	nounts	are est	mated	bv % u	اعصاله	بواقية فيحجومها	. welai	Procedure No. RMRS/OPS-PRO.101
	1170	outy or	oven o	ore, lacc	wrate 1	lootada	measi	irements ho	t poss	ible.
	1-1 -	~ U U U		mor da	matri	-				Date effectives 12/21/09

R	OCK	Y FL	ATS E	NVII	RON	A P NO				FORM PRO.101A
В	orehol	e Nun	nber:	CP3	1-061	4514.1	AL I	ECHNO)LO	SY SITE BOREHOLE LOG PAGE 1 OF 2
1 10	DCETTION	1 - Nor 3-1-0	th : <u>54</u>	reye	∠ Ea	st: _£	nrucy	d		Surface Elevation: Surveyed Area: 903 Pad
, v	<u></u>		Pad	·					•	Total Depth: 17.5
Di	rilling (Equip.:	Po	Well	robe	-			:	Company: URS
_			_	-					: 	Sample Type: _dual tabe
I K	MKS	LOGC	JING S	SUPE	RVIS(OR				
A	PPHC	VAL	-							DATE
ğ,	Į į	188	4 5	¥	0	Må		1	٥	
288	δð			PACTUR AGE	1004	CANN BUT	2 S	£ 5	≥8,	
50.	5	E E	3 . Y E	154	* *	3 6	3 %	8.	1 2 E	SAMPLE DESCRIPTION
					—	-			1	
[1	1	1			ŀ	GM		111	0-3- Sand-silt-elay mixN/e with gravel dark ye llowish boom 1000
1	1		1	l				- -	111	
1	· .	l						_/_	•	1 for my-gradid
l	1									Sand-medcoarse gr. subminded
	l	1								gravel-subangular, quarzite (0.11)
1	l	1								0. , ,
}	l	l] .					-2-		
		ĺ.							14	[Fi/l]
						- 1		7	.	·]
				- 1	.	- 1		-3-	1.11	
			3.5	- 1	· 1	- 1	- 1		$ \cdot $	
40	4.0	4.0	R	.	.	- 1	_		}"	3.5-12.0 Clayey Gravel
-		7.0	Voc	- 1	: 1	- 1	GC	_4_	///	yellowish red Syp 5/2 1
			45	- 1	1	1	Γ	_ / _	1.0	reddishgray SYR 5/2 to gray 6/1
		1	73	1	- 1	1	- 1		1	gravel - Subangular quartzile
1			vα	- 1	ŀ	i		·	//	poorly-graded
- 1		1	- 1				<u> </u>	-5-	1	clay - stiff to so
- 1	ĺ		•	- 1		ľ	L	!	9	clay - stiff, trace sand - med.,
j			- 1	- 1	.	- 1	ſ	7		slightly moist subrounded
1		, t	60		- 1	- 1	-	-6-	//	[Allunum]
- 1	- 1	I	`		· 1	- 1	1		7/	
	- 1	- 1		· ·	.	- 1	- F	• -1/2	//	·
- 1	- 1		- 1	- 1	- 1	- 1		7 /		
					1	- 1	Г	-/ - /	/	1
- 1	- 1		- 1		- 1	- 1	L	. 4		
		- 1	1	· ·			ł		//	
~ .					. [-	- 8 -	/	
6.8	8.0	4.0		1	1	ļ	ŀ	k		<u>.</u>
1	1	Ŧ	1	1		1	. '	· +3	//	
- 1	1	- 1		- 1.			L	_g_/	10	Clayey Gravel as above with
ł	1	j			- 1		ſ	~ / ¬ /		Clayey Gravel as above with pale red 10R6/3
- 1	· [- 1	1	1	- 1	1			9	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	1	.]	- 1	1	1	- (- 1	10 1/		1
NOTE	<u>-</u>				اسائست		-	,0		
HO IE	o: Ger Ma	rorat; (Ieriale :	JSCS is Mnount	modifi and and	led for t	nis log	as folio	ows: Instead of		Procedure No. RMRS/OPS-PRO.101
	(1)	Dadiy I	proxen (core, ia	ccurale	footac	e meas	turements i	hal as	refinie
	(2)	Core b	reaks c	annoj t	o mate	tried, a	ccurate	tootage m	ORSUN	oments not possible. Date effective: 12/31/98

Page 27 of 28

RI		LOGO	Pov ING		RVIS	OR	,		: : :	Company: UKS Project No.: Sample Type: Project No.:
9 CO M	TOPROTTON SO	MARTINE MARTIN	SAUPLE	FINCTURE	MON	ONNE SUE	USCS	Marine M	Lingtook	SAMPLE DESCRIPTION
	6.0	7.8 P	14. Z Dvoc 4.7 Voc 5.2				GC GC CL	- 12 - 13 - 14 - 15 - 16 - 17 - 18		Clayey Gravel as above 11.0-11.5 Sandy Clayey Gravel 50/0000000000000000000000000000000000

14011-130-0134-130yForm GT.IANO3/01/423



R	OCK	FLA	TS E	NVIE	RONN	IENT	ALT	ECHNO	LOG	Y SITE BOREHOLE LOG PAGE _ L OF _ !
Bo	rehole	Num	ber: _	<u> CP3 (</u>	<u> </u>	41				Surface Elevation:
	cation ite:3			1170.	<u>1</u> _ca:	st: <u>20</u>	186	•7		Area: 900-11 (903 Pal)
Ge	eologis	t: <u> </u>	Tur	A		· · · · ·				Total Depth: Project No.: &&210100
. Dr	illing E	quip.:	Lyne	Weekn	AP.	1000	<u> </u>			Sample Type: selit-spoon
	MRS L PPRO		ING S	SUPE	RVIŠ(OR				
<u> ^'</u>	1-	₩. €		T		,		T		DATE
TOP-BOTTOM OF CORE	TOP/BOTTON OF INTERVAL	FEET OF COR ININTERVAL PIELD MEASUREMEN	SAMPLE NUMBER	FAACTURE	BEDDING	GRAIN SIZE DISTRIBUTION	USCS	DEPTH IN	SOU LITHOLOGIC LOG	SAMPLE DESCRIPTION Bogin 3-29-05 0925
	1.							18		
		· —						_		drilling from 0 to 19.5' without
	1825	34	-			·		-19-		Adverse fuel-wall, reparse-circulation drilling from 0 to 19.5' without samplings cuttings indicate gravel] tweeter added to our throughout drillings?
	19.5		19.5		·			_		- 19.5-20.0 Sendy Stevel, reddish
1 .		1.5	G				GР			YELLOW 7.5 40 4/1 0000 miles 1/47
		15	20.0 H		·			— 10—		grava, suovenna month
		-	20.5			·				L20.0-21.0 TD, Clay, light olive ason 546/
-	21.0			·		4		-21-		Clay light olive gray 546/2 mother with yellowish books
	TD				·		٠.			mother with yellowish brown 104 & 5/8, very st. Ff mosst * [worthored Bulrock]
										Emalhoral Bellock J.
						1				
							. }		'	
	.							- 23	İ	
<u></u>			· .							
			j			1				
	. [•			.	I	-24-		
							•			
	·	l		·						
					•	·	- 1		.	
	1				1.		j		.	
	- 1								, ,	
		.]					7.			
					}		f		ŀ	
							}			
NOT	ES: Ge	neral:	USCS	is mod	ified for	this lo	g as fo	llows:		Procedure No. RMRS/OPS-PRO.101

viaterials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate tootage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

Date effective: 12/31/98

Page 27 of 28

D: G: D:	eologication	- Nor -1-0 st:	th: <u>Su</u> Fach Pach	veyeo evo ver fro	Ea bo	st: _S				Y SITE BOREHOLE LOG PAGE _/ OF 2_ Surface Elevation: Surveyed Area: 103 Fad Total Depth: 17.5' Company: URS Project No.: Sample Type: dual take
	MRS I		SING S	UPE	RVISC	OR				DATE
MOTORNOT SACO TO	10-10-10-10-10-10-10-10-10-10-10-10-10-1	Manager of the Control of the Contro	SAMPLE SAMPLE	FACTURE	STORY .	ONTHROTION	10 SC 8	100 m	100 CO	SAMPLE DESCRIPTION
8.0	4.0	40	Composite & Screen 0-10' 09 00 15 00 18 E				GM CL YGC	- 3 3		Sand-silt-clay mixture withgravel dark reddish brown SYR 3/3 poolly-graded gravel-subangulan quantzik, granici (O.1in) coarse-medium sand, subrounded soft, slightly moist [Fill] 3.4-4.0 Gravelly Clay [Alluvium] H-gray 104R 7/2 poorly-graded gravel-subangulan quantzita (O.05:in) soft, moist 4.0-4.5 Gravelly Clay [Allunium] 4.5-12.0 Clayey Gravel gravel(O.1in) quantzite darkgray 7.5YR Subangulan clay-stiff, slightly moist [Alluvium]
HOI	M; (1)	ateriais Badiy	broken	s are p	stimate Iccurat	d by 9 Goota	volum ge mei	ie instead o Isurements	not po	Procedure No. RMRS/OPS-PRO.101 ight. Revision 0 mable. Date effective: 12/31/98 ements not possible. Page 27 of 28

14011-430-0134-930y Farm GT, SANONOS-921

ROCKY FLATE ENVIRONMENTAL TECHNOLOGY SITE BORRENOLE LOG PAGE 2 OF L Borshold Humber: CP 39 - 66 2 Location North Interest East: Survey Geologist: A Factor Origin Equip: Discorper Company: US: Project No. Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Callenning For a bear of the sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be Callenning Sample Type: dead to be		OCV	V	ATTO				_			FORM PRO.101A					
Location - North: Springed East: Surround Date: 3-00 Coologist: A Fockway Company: Location - North Foreign East: Surround Total Date: 3-00 Company: Location - North East - Sample Type: Local Date: 1-00 Company: Location - North East - Sample Type: Local Date: 1-00 Company: Location - North East - North			a Atu	-r V191	EN VIE	RONN	TENT	ALI	TECHNO	LOG	Y SITE BOREHOLE LOG PAGE 2 00 2					
Date: 3-1-05 Geologist: Albertaw Drilling Equip: ForesPots RMRS LOGGING SUPERVISOR APPROVAL		Location - North: Survayed East: Survayed Surface Elevation: Survayed Area: 903 Pad Geologist: A Pacheco Total Depth: 19.5'														
Geologist: A Cacher Drilling Equip: Leve Park RMRS LOGGING SUPERVISOR APPROVAL DATE SAMPLE DESCRIPTION SAMPLE DESCRIPTION Clay ey Gravel as above [Allwrinn] 12.0 12.0 4.0 12.0 12.0 4.0 13.0 16.3 - 17.3 Sanky Clay with trace gravel As above [Allwrinn] 17.3 Sanky Clay with trace gravel As above [Allwrinn] 18.0 16.0 2.0 18.1 17.3 Sanky Clay with trace gravel As above [Allwrinn] 18.1 18.5 Project No.: 18.1 18.5 Project No.: 18.1 18.5 Project No.: 18.2 18.5 Project No.: 18.3 Sample Type: _dual_file SAMPLE DESCRIPTION 18.4 18.5 Sanky Clay with trace gravel As above [Allwrinn] 18.0 16.3 - 17.3 Sanky Clay with trace gravel [Collination] 18.1 18.5 Project No.: 18.1 18.5 Project No.: 18.2 18.5 Project No.: 18.3 India of the colling trace As above [Allwrinn] 18.4 Public Refusal at 18.0 ft. 20.4 Public Refusal at 18.0 ft. 20.4 Public Refusal at 18.0 ft. 20.4 Public Refusal at 18.0 ft. 20.4 Public Refusal at 18.0 ft. 20.4 Public Refusal at 18.0 ft. 20.4 Public Refusal at 18.0 ft. 20.5 Project No.: 20.5 Project No.: 20.5 Project No.: 20.6 Public Refusal At 18.0 ft. 20.6 Public Refusal At 18.0 ft. 20.6 Public Refusal At 18.0 ft. 20.7 Public Refusal At 18.0 ft. 20.8 Public Refusal At 18.0 ft. 21.1 Public Refusal At 18.0 ft. 22.1 Public Refusal At 18.0 ft. 23.1 Publi	1 6	Oate: 3-1-05 Geologist: A Pacheo Drilling Equip. Park Role Company: VRS Propert No.														
Drilling Equip: Project No.: RMRS LOGGING SUPERVISOR APPROVAL DATE Sample Type: dual falk SAMPLE DESCRIPTION SAMPLE DESCRIPTION Clay ey Grarel as above [Allumin] 12.0 12.0 4.0 13.0 14.5 -15.0 Sandy Clay unith trace grand as above (Allumin) 3 rading into Climping 4.5 as above (Allumin) 3 rading into Climping 4.5 as above (Allumin) 3 rading into Climping 4.5 as above (Allumin) 17.3 -18.0 Clay ey Grarel 4.5 above (Allumin) 18.0 16.0 2.0 19.1 by 19.1 by 19.1 by 19.1 long of grand 19.2 long of grand 19.3 long of grand 19.4 long of grand 19.5 long of grand 19					200	 -		<u> </u>	·							
RMRS LOGGING SUPERVISOR APPROVAL BY STATE SAMPLE DESCRIPTION Clay by Gravel as a Love [Allwrinin] 12.0 12.0 4.0 12.0 12.0 4.0 13.0 16.0 4.0 16.0 16.0 16.0 16.0 16.0 16.0 16.0 16	0	rillina l	oı. <u>.∠</u> Fouis	Po	wr. Po	- i					Company: VRS Project No.					
RAMPLE DESCRIPTION DATE SAMPLE DESCRIPTION Clay by Grarel at above [Allumini] 12.0 12.0 4.0 15.0 16.0 16.0 2.0 16.0 16.0 2.0 NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: NOTES: Generat: USCs is modified for this log as below: Procedure No. RMRS/OFS-PRO. 10 (1) Baily broken core, accurate footage measurements not possible. Procedure No. RMRS/OFS-PRO. 10 Date offictive: 1201/98 Procedure No. RMRS/OFS-PRO. 10 Date offictive: 1201/98 Procedure No. RMRS/OFS-PRO. 10 Date offictive: 1201/98	-		-quip.		~~~					:	Sample Type: _dual to be					
APPROVAL By State of the state	R	RMRS LOGGING SUPERVISOR														
SAMPLE DESCRIPTION Sample Description Sample Description Sample Description		APPROVAL														
Clayey Gravel as above CAllwining Clayey Gravel as above CAllwining CAllw	-	1-	L.,	FI	T						DATE					
Clayey Gravel as above CAllwining Clayey Gravel as above CAllwining CAllw	Ιğ.	ĮŽ.	₹ 0 ₹.	ği a e	1 W	10	HŞ	1	2							
Clayey Gravel as above CAllwining Clayey Gravel as above CAllwining CAllw	288	88	뒐겖	된 롤폼	1 8 8	5 8 1	25	₩ Q	2 5	1280						
Clayey Gravel as above CAllwining Clayey Gravel as above CAllwining CAllw	50	18		죍. 젖글	1 % 3	84	1 8 6	3 2	8.2	18 5 a	SAMPLE DESCRIPTION					
120 120 140 13 145 150 Sandy Clay with trace grand 145 150 Sandy Clay with trace grand 150 163 Clayey Gravel 150 163 Clayey Gravel 163 173 Sandy Clay with trace gravel 163 173 Sandy Clay with trace gravel 163 173 Sandy Clay with trace gravel 160 160 160 173 180 Clayey Gravel 173 180 Clayey Gravel 173 180 Clayey Gravel 173 180 Clayey Gravel 173 180 Clayey Gravel 180	-	+	- - -	₹	-	ļ	- 8	!		1.3						
120 120 140 13 145 150 Sandy Clay with trace grand 145 150 Sandy Clay with trace grand 150 163 Clayey Gravel 150 163 Clayey Gravel 163 173 Sandy Clay with trace gravel 163 173 Sandy Clay with trace gravel 163 173 Sandy Clay with trace gravel 160 160 160 173 180 Clayey Gravel 173 180 Clayey Gravel 173 180 Clayey Gravel 173 180 Clayey Gravel 173 180 Clayey Gravel 180	Į .	1	1	1	1	1		GC	1	14	Clause Command					
120 120 140 15 15 15 15 15 15 15 1	l	1	1	1	1	1 .	i		Ŀ	ľ/%	ciayey ararel as above					
grading in to 14.5-15.0 Sandy Clay with trace gravel 3 stating in a Collination 15.0-16.3 Clayey Gravel 45 above [Allumin] 3 stating into 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayey Gravel 45 above [Allumin] 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 19.0 Ho. 2.	ĺ	ı	l	1	1]	{		$\Gamma \cdot \neg$	19/	[Allunum7					
grading in to 14.5-15.0 Sandy Clay with trace gravel 3 stating in a Collination 15.0-16.3 Clayey Gravel 45 above [Allumin] 3 stating into 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayey Gravel 45 above [Allumin] 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 19.0 Ho. 2.	l	.	1	1	1	1	1	l		'/]					
grading in to 14.5-15.0 Sandy Clay with trace gravel 3 stating in a Collination 15.0-16.3 Clayey Gravel 45 above [Allumin] 3 stating into 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayey Gravel 45 above [Allumin] 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 19.0 Ho. 2.	i	1	1	1	1	1.	{	1	" "	14/	'					
grading in to 14.5-15.0 Sandy Clay with trace gravel 3 stating in a Collination 15.0-16.3 Clayey Gravel 45 above [Allumin] 3 stating into 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayey Gravel 45 above [Allumin] 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 19.0 Ho. 2.	ł	1	1	1	1		i	١.	L	1//]					
grading in to 14.5-15.0 Sandy Clay with trace gravel 3 stating in a Collination 15.0-16.3 Clayey Gravel 45 above [Allumin] 3 stating into 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayey Gravel 45 above [Allumin] 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 18.0 Ho. 2.0 19.0 Ho. 2.	l	J	1	1	1 1		1	1		1/1						
grading in to 14.5-15.0 Sandy Clay with trace gravel grading in Collination 15.0-16.3 Clayey Gravel 95 above [Allumin] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 17.3-18.0 Clayey Gravel as above [Allumin] 18 push refusal at 18.0 ft. 19 push refusal at 18.0 ft. 2 push refusal at 18.0 ft. 2 push refusal at 18.5' (3rd Rish) 17.3-19.5 Clayey Gravel pinkish gray SYR 712, yellomsk red SYR 10; gravel - year stiff, skild he most fallowing NOTES: General USCS is modified for this log as tollows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are postmeted by % volume instead of % weight. (1) Badly broken core, isccurate footage measurements not possible. Date effective: 12/31/98	120	120	4.0	1	1		ł	l	L	Y/,]					
grading in to 14.5-15.0 Sandy Clay with trace gravel grading in Collination 15.0-16.3 Clayey Gravel 95 above [Allumin] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 17.3-18.0 Clayey Gravel as above [Allumin] 18 push refusal at 18.0 ft. 19 push refusal at 18.0 ft. 2 push refusal at 18.0 ft. 2 push refusal at 18.5' (3rd Rish) 17.3-19.5 Clayey Gravel pinkish gray SYR 712, yellomsk red SYR 10; gravel - year stiff, skild he most fallowing NOTES: General USCS is modified for this log as tollows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are postmeted by % volume instead of % weight. (1) Badly broken core, isccurate footage measurements not possible. Date effective: 12/31/98	ł			7			ł	1	- /2-	1/1	1					
grading in to 14.5-15.0 Sandy Clay with trace gravel grading in Collination 15.0-16.3 Clayey Gravel 95 above [Allumin] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 17.3-18.0 Clayey Gravel as above [Allumin] 18 push refusal at 18.0 ft. 19 push refusal at 18.0 ft. 2 push refusal at 18.0 ft. 2 push refusal at 18.5' (3rd Rish) 17.3-19.5 Clayey Gravel pinkish gray SYR 712, yellomsk red SYR 10; gravel - year stiff, skild he most fallowing NOTES: General USCS is modified for this log as tollows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are postmeted by % volume instead of % weight. (1) Badly broken core, isccurate footage measurements not possible. Date effective: 12/31/98		1	1	1	1.	1	ł	l]	17%						
grading in to 14.5-15.0 Sandy Clay with trace gravel grading in Collination 15.0-16.3 Clayey Gravel 95 above [Allumin] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 17.3-18.0 Clayey Gravel as above [Allumin] 18 push refusal at 18.0 ft. 19 push refusal at 18.0 ft. 2 push refusal at 18.0 ft. 2 push refusal at 18.5' (3rd Rish) 17.3-19.5 Clayey Gravel pinkish gray SYR 712, yellomsk red SYR 10; gravel - year stiff, skild he most fallowing NOTES: General USCS is modified for this log as tollows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are postmeted by % volume instead of % weight. (1) Badly broken core, isccurate footage measurements not possible. Date effective: 12/31/98		l	1	1				1	r -1	1/2/	{					
grading in to 14.5-15.0 Sandy Clay with trace gravel grading in Collination 15.0-16.3 Clayey Gravel 95 above [Allumin] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 9rading into 16.3-17.3 Sandy Clay with trace gravel [Collination] 17.3-18.0 Clayey Gravel as above [Allumin] 18 push refusal at 18.0 ft. 19 push refusal at 18.0 ft. 2 push refusal at 18.0 ft. 2 push refusal at 18.5' (3rd Rish) 17.3-19.5 Clayey Gravel pinkish gray SYR 712, yellomsk red SYR 10; gravel - year stiff, skild he most fallowing NOTES: General USCS is modified for this log as tollows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are postmeted by % volume instead of % weight. (1) Badly broken core, isccurate footage measurements not possible. Date effective: 12/31/98	1	1	1	1	1	·		1	1	Y/,						
14.5-15.0 Sandy Clay with trace gravel 3 rading in Icalianium 15.0-16.3 Clayer Gravel 95 above [Allunium] 16.0 16.3-17.3 Sandy Clay with trace gravel 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayer Gravel 28 above [Allunium] 17.3-18.0 Clayer Gravel 29 as above [Allunium] 18.0 the 2.0 19.1 19.5 push Refusal at 18.0 ft. 19.1 19.5 push Refusal at 18.0 ft. 19.2 19.5 push refusal at 18.0 ft. 20 19.5 push refusal at 18.0 ft. 21 22 push refusal at 18.0 ft. 22 23 push refusal at 18.0 ft. 23 24 push refusal at 18.0 ft. 24 25 push refusal at 18.0 ft. 25 26 push refusal at 18.0 ft. 26 27 push refusal at 18.0 ft. 27 28 push refusal at 18.0 ft. 28 29 push refusal at 18.0 ft. 29 20 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0		1	1	ì	1 1				-13-	1/.						
14.5-15.0 Sandy Clay with trace gravel 3 rading in Icalianium 15.0-16.3 Clayer Gravel 95 above [Allunium] 16.0 16.3-17.3 Sandy Clay with trace gravel 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayer Gravel 28 above [Allunium] 17.3-18.0 Clayer Gravel 29 as above [Allunium] 18.0 the 2.0 19.1 19.5 push Refusal at 18.0 ft. 19.1 19.5 push Refusal at 18.0 ft. 19.2 19.5 push refusal at 18.0 ft. 20 19.5 push refusal at 18.0 ft. 21 22 push refusal at 18.0 ft. 22 23 push refusal at 18.0 ft. 23 24 push refusal at 18.0 ft. 24 25 push refusal at 18.0 ft. 25 26 push refusal at 18.0 ft. 26 27 push refusal at 18.0 ft. 27 28 push refusal at 18.0 ft. 28 29 push refusal at 18.0 ft. 29 20 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0		}	1	ſ	1 1			l	1 1	1.9/						
14.5-15.0 Sandy Clay with trace gravel 3 rading in Icalianium 15.0-16.3 Clayer Gravel 95 above [Allunium] 16.0 16.3-17.3 Sandy Clay with trace gravel 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayer Gravel 28 above [Allunium] 17.3-18.0 Clayer Gravel 29 as above [Allunium] 18.0 the 2.0 19.1 19.5 push Refusal at 18.0 ft. 19.1 19.5 push Refusal at 18.0 ft. 19.2 19.5 push refusal at 18.0 ft. 20 19.5 push refusal at 18.0 ft. 21 22 push refusal at 18.0 ft. 22 23 push refusal at 18.0 ft. 23 24 push refusal at 18.0 ft. 24 25 push refusal at 18.0 ft. 25 26 push refusal at 18.0 ft. 26 27 push refusal at 18.0 ft. 27 28 push refusal at 18.0 ft. 28 29 push refusal at 18.0 ft. 29 20 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0		l	1 .]			1	-	16	i [.]					
14.5-15.0 Sandy Clay with trace gravel 3 rading in Icalianium 15.0-16.3 Clayer Gravel 95 above [Allunium] 16.0 16.3-17.3 Sandy Clay with trace gravel 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayer Gravel 28 above [Allunium] 17.3-18.0 Clayer Gravel 29 as above [Allunium] 18.0 the 2.0 19.1 19.5 push Refusal at 18.0 ft. 19.1 19.5 push Refusal at 18.0 ft. 19.2 19.5 push refusal at 18.0 ft. 20 19.5 push refusal at 18.0 ft. 21 22 push refusal at 18.0 ft. 22 23 push refusal at 18.0 ft. 23 24 push refusal at 18.0 ft. 24 25 push refusal at 18.0 ft. 25 26 push refusal at 18.0 ft. 26 27 push refusal at 18.0 ft. 27 28 push refusal at 18.0 ft. 28 29 push refusal at 18.0 ft. 29 20 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0		1	· '	1	1 1			Ì	1 1	15/						
14.5-15.0 Sandy Clay with trace gravel 3 rading in Icalianium 15.0-16.3 Clayer Gravel 95 above [Allunium] 16.0 16.3-17.3 Sandy Clay with trace gravel 16.3-17.3 Sandy Clay with trace gravel 17.3-18.0 Clayer Gravel 28 above [Allunium] 17.3-18.0 Clayer Gravel 29 as above [Allunium] 18.0 the 2.0 19.1 19.5 push Refusal at 18.0 ft. 19.1 19.5 push Refusal at 18.0 ft. 19.2 19.5 push refusal at 18.0 ft. 20 19.5 push refusal at 18.0 ft. 21 22 push refusal at 18.0 ft. 22 23 push refusal at 18.0 ft. 23 24 push refusal at 18.0 ft. 24 25 push refusal at 18.0 ft. 25 26 push refusal at 18.0 ft. 26 27 push refusal at 18.0 ft. 27 28 push refusal at 18.0 ft. 28 29 push refusal at 18.0 ft. 29 20 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 20 27 push refusal at 18.0 ft. 20 28 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0 ft. 24 push refusal at 18.0 ft. 25 push refusal at 18.0 ft. 26 push refusal at 18.0 ft. 27 push refusal at 18.0 ft. 28 push refusal at 18.0 ft. 29 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 20 push refusal at 18.0 ft. 21 push refusal at 18.0 ft. 22 push refusal at 18.0 ft. 23 push refusal at 18.0		1	1	1		[/4	19	aradina in to					
AS above [Allumin] AS abov		1	1	1	1 1)]	11/						
AS above [Allumin] AS abov		1		1	1 1			5	- -	ارتجر	14.5-15.0 Sandy Clay with trace and					
AS above [Allumin] AS abov		l	1	N	1 1			a	l· [11.1	grading into [collavion]					
AS above [Allumin] AS abov		1	l	6	, ,	•			├ ─ <i>'\5-</i> -	/ Ku	15.0-16.3 Clayey Gravel					
160 160 4.0 16.3 - 17.3 Sandy Clay with trace gravel [Colliminian] 3rading into 16.3 - 17.3 Sandy Clay with trace gravel [Colliminian] 3rading into 17.3 - 18.0 Clay ey Gravel 4s above Allunian] 18.0 ft. 20 18 18.0 ft. 20 20 20 20 20 20 20 2		1	ı	,	ii	ı		4	1 1	6/	as above Com					
10.3 - 17.3 Sanky Clay with trace gravel		١.	١.	3	1 1	- 4	!	GC	┝ . ┥	1/	[Allunum]					
10.3 - 17.3 Sanky Clay with trace gravel	160	16.0	4.0	8	1 1	. 1	- 1			/•/	\$ <i>4</i>					
10.3 - 17.3 Sanky Clay with trace gravel				15		- 1	- 1		-16-	///	grading into					
Solution Solution		ŀ	1	0	l i	. 1		5	1	151)	-16.3-17.3 Sandy Charatter +					
M.5 19.5 19.5 19.5 19.5 19.5 19.5 19.5 19	Ì		1	10		, 1	· 1	CL	⊢ -{	1/./	Coll "					
17.3-18.0 Clay ey Gravel as a bove [Allunium] [St push Refusal at 18.0 ft. Due to presence of gravel, 2nd push needed. 2nd push refusal at 18.0 ft. (2'away from 1st) 3rd push offset 3.7' west. Refusal at 18.5' (3rd Rush) 17.3-19.5 Clay ey Gravel Pinkish gray 5YR 7/2, yellunish red 5YR [Allunium] NOTES: Generat: USCS is modified for this log as follows: Notes: Generat: USCS is modified for this log as follows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are instinated by % volume instead of % weight. (1) Badily broken core, securiate footage measurements not possible. Date effective: 12/31/98		.		2	l. I	: I	1	استعكر	[///						
B.0 16.0 2.0	ł	ľ	•	2		- 1		↓	-17-	1/1	grading into					
B.0 16.0 2.0			1	3.1	1 1	- 1	Ì	'	ŀ	15/	11.3-18.0 Chyey Grand					
Allunim Ist push Refusal at 18.0 ft. Due to presence of gravel, 2nd push needed. 2nd push refusal at 18.0 ft. (2' away from 1st) 3rd push refusal at 18.0 ft. (2' away from 1st) 3rd push refusal at 18.0 ft. (2' away from 1st) 3rd push offset 3.7' west. Refusal at 18.5' (3rd Rush) 17.3 - 19.5 Clay ey Gravel Pinkish pany 5YR 7/2, yellunish red SYR 10 gravel - qualitate (0.11) Sub angular 4/6, oky-very stiff, shyldy moist [Allunival] NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (1) Badly broken core, securate footage measurements not possible. Date effective: 12/31/98			•	0	{	- 1	ŀ	/.	- 4	1.1						
M.5 19.5 NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	18.0	160	2.0]	 	·]	I	aU	ł	1/	[Allunim7					
M.5 19.5 NOTES: General: USCS is modified for this log as follows: Notes: General: USCS is modified for this log as follows: Notes: General: USCS is modified for this log as follows: Notes: General: USCS is modified for this log as follows: Notes: General: USCS is modified for this log as follows: Notes: General: USCS is modified for this log as follows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98				1	1 1	_ 1	ł		-8-Y	1/1	9					
NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	.	. '	1	1		• 1	1			1/	Dund Kerusal at 15.0 H.					
NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98			1	{ i		ı	ł			4/1	To presence of gravel, 2nd push needed.					
NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98			1			1	- 1	. [7	1.1	2 push refusal at 18.0ft. (2'away from let)					
NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: General: USCS is modified for this log as follows: NOTES: Procedure No. RMRS/OPS-PRO.101 Materials amounts are pstimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98			1	19.1	1	. 1	ł	ł	_/9 _/	//,	Jra push offset 3.7' Wast. Refusal at 19.5'					
NOTES: General: USCs is modified for this log as follows: NOTES: General: USCs is modified for this log as follows: Procedure No. RMRS/OPS-PRO.101 Materials amounts are patimated by % volume instead of % weight. (1) Badly broken core, isoccurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	: [Dyn		- 1	- 1	ſ	7/ 7	7	-1 3rd Rush) 1/3-19 5 Classes 6-100					
NOTES: General: USCS is modified for this log as follows: Materials amounts are estimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	19.5	19.5				. 1	ŀ	·	1	11	Pinkish gray 5YR 1/2 wellwork and avo					
NOTES: General: USCS is modified for this log as follows: Materials amounts are estimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98				19.5	}		t		+		10= gravel - qualterte (0.1) Subaranher ull					
NOTES: General: USCS is modified for this log as follows: Materials amounts are estimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	<u>. </u>			<u> </u>			. 1	Ì	20	; l	195 olay-very stiff, shally moist TAIL					
Materials amounts are estimated by % volume instead of % weight. (1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	NO.									+						
(1) Badly broken core, accurate footage measurements not possible. (2) Core breaks cannot be matched, accurate footage measurements not possible. Date effective: 12/31/98	NUT	ES: G	eneral;	USCS	s mod	med for	this lo	g as fo	dows:	:	Procedure No. RMRS/OPS-PRO.101					
(2) Core breaks cannot be matched, accurate tootage measurements not possible.		,	ratonal ė	s amou	nis are j	esuma(OD DY	wolur	ne instead o	31% W	elght. Revision 0					
(-) and property and materials, according tooking the strategies for possible.		,	5) C~~	i brasta	CROSCI	be er	10012 10012	ige me	asurement	Lot b	Date effective: 12/31/98					
		۱,	-,	una			······································		wwaga 1	.₩ 43 U	Page 27 of 28					

(40) (-430-0) 54-430kFerm GT, (A)(03/0)/42)

Date: Geologi Dritting t	3/246/ st: N W Equip.: 69	os Villizin	- Ea	st: _< 1, BU(ישרשני	Z	GY SITE BORIEHOLE LOG PAGE 1 OF Surface Elevation: Survey Area: 903 / Total Depth: 27 Company: VEC Project No.: Sample Type: Split Speed
RMRS APPRO	LOGGING DVAL	SUPE	RVIS	OR	,		
PowerTown of Congress H BOX 10*80TOWN	PERIOD CONTRIBUTION (PIECE PROPERTY)	FACTURE	PROUP .	DAMA SUZE DET PREOTON	USCS	DEPTH IN FEET AND LESS AND LES	SAMPLE DESCRIPTION
25'	5/2.0 F 20/2.0 G					-20- = -2122242522242527289	0-19' DUAL WALLS-RAPERT CRECULATION PRECUESTION DRIVED 0-19' SDE POWER PEOPLE LOG FLOM GETATUS 19-21' CPANELY SAND, STRONG PROMY, TO GRAY (7.79RG/) F-C GLAVEL, WELLGLANTO SUBMICHER GLAND SUBBOUNDED, ETZ, LOSSE SATURATED THACE CLAY SILL. 21'-22' GLANDLLY CLAY, YOU ON BH BROWN (10/R5/4) FINE GLAVEL, POOLLY GLADO, SMBATKYLLIAR, QUALTRITE, STIPF, DR. (10/R3/3), SOME CAND + SUT, LON PLASHICITY, DR. (WATER INTRODUCTO DURING DRINGING). 23-24' AS ABONE 24-25' CARUSTONE/CLAY ABONE BEDROCK STAPPLE 21-22'. INTENTACE, 22-23'. BEDROK 24-25' TD=25' Procedure No. RMRS/OPS-PRO.101

14011-930-0134-9308Form GT, IANO MOLISTO

Page 27 of 28

RMR	Equip.: S LOGO ROVAL	_	-		OR .		•	!	Company: URS Project No.: Sample Type: dual table
TOWNOT TOWNOT	PET OF COM MENTERNAL PRESENT	SALPLE NAMES	FANCTURE	J.Du.	CONNECTE DESTRUCTION	USCS SYMBOL	# E55	LITTORY CONT.	SAMPLE DESCRIPTION
0 4.0 TES: G	4.0	SCS is	modifie	od for the		GM			Sand-silt-clay mixture withgravel dark reddish brown SYR 3/3 poolly-graded gravel-subangulan quantite, gramm. (O.lin) coarse-medium sand, subrounded soft, slightly moist [Fill] 3.4-4.0 Gravelly Clay [Allumin] H-gray 104R 7/2 poorly-graded gravel-subangulan quantite (O.05.in) soft, moist 4.0-4.5 Gravelly Clay [Allumin] 4.5-12.0 Clayey Gravel gravel(O.lin) quantite darkgray 7.54R Subangulan clay-stiff, slightly moist [Allumin] Procedure No. RMRS/OPS-PRO.101

14011-120-0134-1308 Farm GT, [ANO 3/01/12]

1	RO	CKY	FLA?	rș e	NVII	ROM	Mesm	PAP -		-	# FORM PRO.101A	
j	Bore	hole t	lumb	BC: (CP3	19_04	rienii Co	IAL.	TECHN (ΝĎ	GY SITE BOREHOLE LOG PAGE 2 OF 2	_
1	LVC	(10 <u>11</u> - 1	NOMN;	Sur	rapid	Ea	ıst:	Sucre	-	:	Surveyed	=
	Date:	: <u>3-/</u>	-05		:				-	•	NOT DIS Pad	
	Geol	ogist:	$\mathcal{A}\mathcal{E}$	<u>ache</u>	40						Total Depth: 19.5	
 	Urium	ig Equ	ip.:_	Por	es.Pr	e be				i	Company: Ves Project No.:	
1	RMR	s Lo	GGD	1G 6	IIPE	RVIS	OB			÷	Sample Type: _dual to be	٠,
1.	APP	ROV	ΔΙ			V Å19	UK			•		4
-	٦.		E	-			-			-	- DATE	
É	Kalê	_ ₹ 8		35	X	9	NE		2	1:0		٠
183		0 50	EES.		15 E	MON.	Charagos Distributing	200	£.5	100 E	g	7
5,	وار	_= 5	3	~ Z	£ .	*	SE	3 2	8.	145	SAMPLE DESCRIPTION	1
		$\neg \neg$				 	-	-	 	1-		ı
ĺ	ı	- 1	- 1	i		1	ĺ	GC	j	17	Clayey Gravel as above	┨
	- 1	-	- }	- 1					├ . -	1/1	CAN	I
	1.		- }	- 1						//	[Allunum]	1
i		- 1							//	10		ı
i	1		- 1	- 1							.]	ı
12	0 12	D 4.	_	- }	·				7	1/1		I
 	~ '-	~ 7 .	-	- 1	- 1	1		'	/2		/	ł
	1	- 1			· }		- 1			10/	A	I
	-	1	- 1		- 1	- 1	- [16	1	ľ
	1	1	ł				j		ĺ	//		l
	1				- 1	.	ı		-13-	•/		ı
١.	1	-			- 1	• 1	- 1	- 1	- 1	1.0%		l
	ı	ł	.]				- 1	ı		[]		
	f	- 1	ı	-	- 1	: 1	1	- [11	[i]		ŀ
	1	1	i	i	i	· 1	1	ſ	-/-	//	grading in to	1
		ł	1	- [f	- 1		\sim	/		<i>y</i> • • • • • • • • • • • • • • • • • • •	ĺ
		1	13	-		ſ	1	\overline{x}	7		14.5-15.0 Sandy Clay with trace grand grand 15.0-16.3 Clayey Gravel	ı
	1	ł	é	1	1		16	<i>ا</i> ل	-15-1		15.0 - 16, 3 Claver 60	
	}	1	ł	-	- 1	- 1		4	Į,	6//	as above s	
/ _	1 "	۔ یا۔	J. Scher	1			10	GC	12		as above [Allumin]	
60	19.0	0 4.0	13	1			- 1	}	!	% .	₩. -	
	l	1	18	ļ				<u> </u>	-16-1/,	12	grading into	
		1	et,	ľ	- 1	- 1.		2		9//	-16.3-17.3 Sandy Clay with trace gravel	
		1	13	- [1:	ŀ	19		· 7/2	!/1	[Collunian]	
			isd.	1	-	l	\Box		_/2			
	İ	1	12	1			- 1	7	" K	//	17.3-18.0 Chyey Grand	
		Ī	1	1	ĺ		1		4/	// h	17.3-18.0 Chyey Grand as above [Allanim]	
8.0	160	2.0	j	1	ł	1	19	14	1/		[Allanin]	
			1	1		ď		-	- 8-1		1st Push Refusal at 18.0 ft.	
ŀ		1	1	1	1	ł	l	I	زيرا	10	Due to organice of which is	
		1	1	1			1.	. 	· 4/		Due to presence of gravel, 2nd push needed. 2nd push refusal at 18.0ft. (2'away from 1st) 3rd push offset 3.7' west. Refusal at 125'	
		1	19.1	1	-			1	. /	/	3rd push offset 3.7 west Refusal as 10.	
ا ـ ا	10 -		Dva	7	1		1.	一	17 - [1 /	1	L(3rd Ruch) 17.3-19 5 Clarate	
1.5	19.5	<u> </u>	├	1	1	1	1			1	Pinkish may 500 th	
- 1		ľ	7.5	1	1.	- 1		_	. +:		10= gravel-quartete() 12, yellowshired SYR	
			L	<u>. </u>	حل			:	20	_ /	-(3rd Rush) 17.3-19.5 Clayey Gravel Pinkish gray 5YR 7/2, yellowish red SYR gravel-quantite (0.11) Subangular 4/6, olay-very stiff, shiply moist [Allavian]	
NOTE	ES: G	enerat	USC	Sharr	odifie	d for th	is log :	na folia	wa ·		Describe at management of	,
	M	atonal	s amoi	unts a	ro bst	mated	bv % u	محدثك	leadand and	لمى كا	Procedure No. RMRS/OPS-PRO.101	
	• •	, حص	y viuk	on co	O. ACI	Curate 1	Cotana	MASO	uramada i		net is the second of the secon	
	(č	. vore	Dreak	a cau	uot pe	match	red, ac	curate	tootage mie	RSUre	ements not possible. Date effective: 12/31/98	
410.01		GT					<u> </u>			-	Page 27 of 28	

ROCKY	TATS I	ENVIR	ONN	TENT	'AL I	ECHNO	100	SY SITE BOREHOLE LOG PAGE _ LOF 2
Borehole N Location • N	Umber: Jorth: Su	Cr39	-06.	3				Surface Elevation: Surveyed
- Cuit,	~ 03		Ea:	st; <u>s</u>	nrray	ed.		A108: 103 Pad
Geologist: . Drilling Equ	A.Pa	heco					:	Total Depth: 16.0' Company: VKS
		-		-			!	Sample Type: Project No.:
RMRS LO	GGING	SUPER	VISC	OR	,			
APPROVA	<u> </u>						1	DATE
5 - 5 - 8	1.6	-	0	шå		T :	<u> </u>	OATE
TOPPED PO COPPE PO PO POPE PO POPE PO POPE PO POPE PO POPE PO POPE PO POPE PO POPE PO	SAMPLE SA	FINCTUR	MOOR	DISTANTED DESTRUCTION	STABOL STABOL	- 44.930 - F231	TION THE	SAMPLE DESCRIPTION
		1 1			GM			0-3. Sand-silt-clay mixture with grave (10%) dark reddish brown Eve 211
	- }	1 1				⊬.⊣		dark reddish brown Syr 3/4
1. 1	- 1	1 1	- 1					Poorly-graded, Subangular gravels [Fill] [Fill]
	1	-	- 1					[Fill]
		1 1	- [į			111	
			ı					
11							11	
	,		- 1	- 1			Ш	
				l		2	HJ	
	AC VOX		1		GC			3.0-Clayey Gravel [Native Soil]
	VOC		- 1	- 1	- }	[1/3	9.5 Reddish brown SYR5/4 to
t.0 4.0 4.0	길 1	1:	- 1		. 1			Inkishgray SYR7/2
.	1 1	1		i	Ī	-4-1	-/	poolly graded, subangular quantzite
	B D	- 1			- 1			dark gray 54R 4/1
1.1	Vac	- 1	- 1				1	dry
	1 1	1	- 1	- 1		-5-1		
	1 1	- 1	- 1		H			· .
1 1	1 1	1.	- 1		- 1			
	1 1	· [.	- }	- 1		- 6 - 1		
	\vdash	- 1.	- [. <i>Y</i>	\mathbb{Z}	
	1 1			1	- 1		1	
	9	- 1	- 1		٦	-7 - /		
11	0.10	- 1	- 1	- 1	L	. <i>X</i>	\mathbb{Z}	
0 80 40	& Screen		- }	· [1		
	اق	1.	-		-	-8-/	/	8.0-12.0 Clayey Gravel as above
		- 1	1		L			(2nd Push)
	14	.		- 1	· [7		·
	San post te	ŀ			. -	-7 /		
	3	1		- }		1	, Ji	More Gravel
		1.	1	- 1	厂	· V	% }	1st Push Refusal at 9.5 ft.
10750	<u></u>	 - -				10 10		
NOTES: General Materia	: USCS k is amount	eifipom i see ass t	d for the	his log	as folio	ws: instead of	· •	Procedure No. RMRS/OPS-PRO.101
(1) 080	ny proxen	core iaco	eis ru	footag	e meas	tillemente i	~	no bla
(2) Con	o Dreaks C	souvot po	matc	hod, a	curate	lootage me	asur	ements not possible. Date effective: 12/31/98

Loc Dat Ge	ehole ation - e: <u>2</u> ologist	Numb North -28-	erc : <u>sur</u> : os : oche	R39 Ryed	-063 Eas					SITE BOREHOLE LOG PAGE 2 OF 2 Surface Elevation: Surveyed Vea: 903 Pad Total Depth: 16.0' Company: URS Project No.: Company: URS Project No.:
	IRS L		NG S	UPER	VISC	R		· • • • • • • • • • • • • • • • • • • •		DATE
OF CORE	TOPROTTON OF HOTENAL	NET OF COPE	SAMPLE, RACEET	FANCTIUME	POOR YOU	GRAN BITE DISTRIBUTION	USCS	e stige.	SOIL LINGLOOK LOG	SAMPLE DESCRIPTION
	16.0	senoral	Noc. USC	S is mo	offied.	or this	log as	-/2/3/3/4/5/6/7/8/9		Clayey Grave - sce a bove gravel - quantite, dk gray 5yr 4/1 Subangulan, crus had grading into Gravelly Clay Reddish brown 2.5yr 4/4 Shiff, slightly moist less gravel Sifty Sandstone reddish brown 2.5yr 4/4 TD=16.01 Gamma Screen of composite samples resulted in 0.0 pci/g Americium. Excess cuttings permitted to go back in hole. Procedure No. RMRS/OPS-PRO.101 Revision 0
	1	Materia (11 Bad	is amo Iv brok	unts are	e pstim	ated by	/ % vol	umo instaa noasureme	nts hot	nogna .

Date effective: 12/31/98 Page 27 of 28

	R	OCK	Y FL	ATS	ENVI	ROM	MEN	PAR S			FORM PRO.101A
	Da Ge	te: ologis	2-28-	05	CP3 arreyed checo one(P		3 st: _s	nrray	ed	LO	GY SITE BOREHOLE LOG PAGE LOF & Surface Elevation: Surveyed Area: 93 Pad Total Depth: 16.0
- 1			-							i	Company: VKS Sample Type: Dual Tabe Project No.:
1	KN AP	iks L PRO	JOGG Vai	ING	SUPE	RVIS	OR				
ł	, ,	3	W. E	=	7=	 				1	DATE
	200 A	TOPROTTO OF HOTERVAL	MARKET OF CO.	TURNS BURNE	FACTURE	NOTE TO	DRAWRIZE DETREOTO	USCS STABOL	Serin a	Litrologe	SAMPLE DESCRIPTION
>.o	S.A	General Control	S Composite & screen needs	CS is	modifie	d for th				1. 1.	0-3. Sand-Silt-clay mixture with grave (10%) dark reddish brown SYR 3/4 Poorly-graded, Subangular gravels [Fill] 3.0-Clayey Gravel [Native Soil] 9.5 Reddish brown SYR 5/4 to Pinkish gray SYR 7/2 Poorly graded, subangular quantzife dark gray SYR 4/1 dry 10-12.0 Clayey Gravel as above (2nd Push) lore Gravel St Push Refusal at 9.5 ft. Procedure No. RMRS/OPS. DRO 101
NO		(1) Ba	gly bro	ken c	ore jace	maled (by % w	s follow olume i	rs: nslead of %	weigi	Procedure No. RMRS/OPS-PRO 101

14011-110-0134-1309Ferm GT.1A3103/01-473

8	ROCK Joreho ocatio	CY FI le Nu n - No	ATS I mber: rth: _5	CP 3	2-06	MENT	'AL'	TECHNO	•	Surface Elevation: Surveyed
	ate: _	2-2	8-05	waye		, <u> </u>	27.70	<u> </u>		Area: 903 Pad
	rillina	151: <u>/</u> 1 Equip	Poch	elo El Pro	be					Company: URS Project No.
—									: 	Sample Type: Dual Tube
A	PPR(DVAL	GING	SUPE	RVIS	OR				DATE
2010	10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	100 E	SAFE,	FINCTIVE	PERON	GWM BUZE DETTMENTOM	USCS	OCTIVE PE	280	
1 2 3	18	P S S S S S S S S S S S S S S S S S S S	3 . 2 2	153	184	3 8	_	8	2 0 S	SAMPLE DESCRIPTION
1	1			1		1	GC		17/	Clayey Gravel - see a bove
	1.							T	1/	gravel-quartzite, dk gray 54R 4/1 Subangular, cruzhed
			1						1/	grading into Gravelly Clay
12.0	12.0	40	1	}						Reddish brown 2.54R4/4
	1	1	1					-/2-		Stiff, slightly moist
			1					├		less gravel
	1		1		٠			,	//	,
	1	}	}					-/3-		
·			Mac		•	- 1		┝╶┩	/:/	
		'		1 1		Į		_/-/		
	1		N	j	1	- 1				Silty Sandstone
									- - -	reddish brown 2-syry/4
					- 1	- 1		-15-1		
				1		- 1	Į			
16.0	16.0	40	} }	.]	.	- {	- {	7	111	
				. 1		t		-/6	44	TD=16-01
						- 1	- }			Gamma Screen of composite samples
				- 1	- 1			_12_	•	resulted in 0.0 pcifg Americian.
					- 1	- 1	- 1	"		Excess cuttings permitted to go back
	}			- 1	1	- 1	t	- 1	.	in hole.
				1	. [-	-18-	. }	
1			1	- {		1		_	1	
	j		1	- 1			. [7		
	I		1	_ [·			ŀ	-19-		
		l	1	- }.	1	1		. 」	:	
			-		- 1	Í		107		1
NOT	~~.				مانحيد			L-L		

Generat: USCS is modified for this log as follows:

Materials amounts are patimated by % volume instead of % weight.

[1] Badly broken core, accurate footage measurements not possible.

[2] Core breaks cannot be matched, accurate tootage measurements not possible.

Procedure No. RMRS/OPS-PRO.101

Revision 0

Date effective: 12/31/98

Groundwater IM/IRA - 903 Pad VOC Investigation

Area 2

Borehole Logs

	Bo Lo Da Ge Dri	oreholication te:eologi illing l	e Num 1 - Nor 3/9/0 st. <u>7</u> Equip.	nber: rth: 74 05 Tu	19247 19247 1924	erpr	ORE	8579			SY SITE BOREHOLE LOG PAGE 2.0F 1 Surface Elevation: Survey Area: 100-11 (903 Pad) Total Depth: Company: URS Project No.: GR 210100 Sample Type: 1145 DUAL TUBE
	•		LOGO	GING:	SUPE	RVIS	OR 			· · · ·	DATE
100000000	OF COPE INBOX	TOP/BOTTON SO	PERT OF CORE IN INTERVAL PIELD	SAMPLE SAMPLE SAMPLE	FPACTURE ANGLE	BEDDING	GRAN SIZE DISTANSUTION	USCS SYMBOL) DEPTH IN	LITHOLOGIC	SAMPLE DESCRIPTION
	•			C 10.5 D				હર કc	-(1 -		yellowish ted 5 YR 5/6, madium, subangular, poorly graded, feldspard ste, slightly moist.
	・ こうかん かいこう かいこう かいこう かんかん かいかん かいかん かいっち かいしゅう しゅうしゅう 大き かいかん かいかん かいしゅう かいしゅう かいしゅう かいしゅう かいしゅう かいしゅう かいしゅう かいしゅう かいしゅう かいしゅう しゅうしゅう	(2.0		14.0 E 15.2 	70				-12- -18- -15- -16- -17- -18- -19-		15. 2 -16.0 A Clay light gray 59 7/1 matted with drue yellow 25 4 6/8 stiff; slightly most, fing subraind sand EWEATHERED DEDROCK!
. N	OTE:	S: Ge	nerat	USCSi	s modif	ed for	this loa	as lol	- 30-1		Procedure No. RMRS/OPS-PRO:101

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate botage measurements not possible.

(2) Core breaks cannot be matched, accurate tootage measurements not possible.

Revision 0

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG PAGE_1 OF Borehole Number: <u>CP39-06</u> S Surface Elevation: Surve Location : North: Survey Date: 42/8/05 -Geologist: Z Tuta N 749 2016 Area: 100-11 (903 Pad Total Depth: _18.0 Ff 59 5 Company: URS Project No.: GR 210100 Drilling Equip .: AMS POWERPROBE 9620 TITAN Sample Type: Ame Duke Tube RMRS LOGGING SUPERVISOR APPROVAL DATE SAMPLE DESCRIPTION Begin 133 2 3/105 0-3.2 Gravelly sand FILL very dk grayish brown 1042/2
Fine-coarse well-gradd,
Subround, quartz, slightly
Moist [FILL] SW 4.0 QC:19 Scrain 3:2-8.0 Sandy grand with clay, strong brown 7.5 YR 5/8 to cc white 7,5 ye 8/1, coarse, goorly graded, subround, ateite, dry. 40 60 60 [At 12.0 pulled arter rods to retrieve 9-12 sample tube] pinkish gray 54R 7/2 to readish yellow 54R 6/6) Coarse, poorly gradel subround, etzite, dry with sime clay (210%) 8,0 4.0 6.7 Procedure No. RMRS/OPS-PRO: 101 NOTES: General USCS is modified for this log as follow Revision 0 Materials amounts are estimated by % volume instead of % weight. (1) Badly bricken core, accurate lootage measurements not possible. Date effective: 12/31/98 12) Core breaks cannot be matched, accurate footage measurements not possible.



$\cdot \cdot $	RO	CK	Y FL	ATS	ENVI	RON	MEN	JAL :	rechno	OLOG	CY SITE BOREHOLE LOG PAGE 2 OF 2
	Bore Loc≈	hok	Nui No	nber: dh: x	ch:	F:	ast o	(ia Avaa	 . ·		Surface Elevation: Survey Area: 100-11 (103 Pad)
` ·	Date	: · '	ZJ 8/ .	05	- 3/9	105		30.007	• •	· •	Total Depth: 18 0 ft
19	Geol	logis	it	Tu	TA	i Izrazá		04			Company: URS Project No.: GR 210100
	Orilli ———	ng E	quip	<u>.: Am</u>	s ga	ERPR	OBE	4620	TITAN		Sample Type: AMS DUAL TUBE
	RMI	RS 1	LOG	GING	SUPI	ervis	OR				
1 /	\PF	PRO	VAL	·							DATE
3	7	ر. ر ا	2₹	£			ыš		7	To	
£ 8	ğ	8			PACTURE ANDLE	Z Z	35	2005 37.00 3	¥ 5	500 × 000 ×	0447 5 05000000
Ş Ş	Z S	5	E E		{ \{ \{ \} \} \	184	8 5	5 %	8	¥ ¥ 3	SAMPLE DESCRIPTION
1			-	1	1-	-	 		10		
1.	:			-		1	ŀ	GP	.	9	!
		•	l	1				1	Γ		
1	ŀ	į		1		-	'		— //—	. •	
].	}		l· ''		
1						ļ ·		i . j	- -		
<u> </u>		_		1				ï	-12		-12.0, -15.2 sendy gravel, as above.
	117	1.0	3.6	1			٠ - ا		٠.		37 Sently gravely as above
			40	1:	1.					0.6	
		ı						. •	13		
ľ	- -						3.		10	•	
	1			ļ						0	
				14.1			•			0	[Sample take driven 16.0 - 18.5 was empty.
	1				T		: :		~14	•	no sample in outer rolls when pulled
· `				C			·	- 1	- `-	0	offset 1' N, Aushad solid point to
				1512]]		of anginal location, pushed solid
: .				1012			. #	—-[-17-	2	Point to 10,5 ft. END OF TAY 3/8/057
				D				ر با	- 4		3/9/85 37 - Busin Author Know to France
	-										ft + 0855]
	16	0)	16.0					-16-1	// h	15.2-16.0 Sandy day,
			2.0			7	[u L			19ht stey 237 5V 71, 41 / 11
			2.8).							office yellow 2.57 6/8, state, Slightly moist theathered Fire survey and DEDROCK DEDROCK DEDROCK JEONO
								-	- <i>17</i> - t		Sightly moist twenthered
<i>(</i> •							- 1		. 」	//	LIGHT BOOTD DEDROCKS
								Care i in			Clay, 9 rey 54 5/1 up some
	-	-1-							-18 - -k	4	mottens alive yellow, 25.76/8.
	18	۰٥۱٦	TD					\$1.8°		- 1/	that decreases with dapth
									. 4	\mathbb{I}	slightly moust stiff
:									19_	[)	very stiff
	λ.		•				ji (1		: '		WEATHERS D PEDROCK
								-			18.0. TD
			·. }	15 / 296335					2/2		
NOT	ES:	Gen	erat	USCS	is mod	fed for	this loc	oc tall			Procedure No. RMRS/OPS-PRO 101

Materials amounts are estimated by % volume instead of % weight.

(1) Badly bicken core, accurate todage measurements not possible.

(2) Core breaks cannot be matched accurate footage measurements not possible.

Revision 0

ı	RO	CKY	FLA	TS 1	NVI	ROM	MEN	TAL	recov		FORM PRO.101A SYSTE BOREHOLE LOG PAGE LOF 2
	Loca Date Geo	ehole N edon - I SE logist: ng Equ	Yorth Hos A-P	er: Sv VX/	Voyed 95	039 E	- <i>O(</i>	26 survey	ed .)LO(Area: 903 Pad
	Dr渊	ng Equ	ip.:_	Pow	466	be	Tu	TA	Total Depth: 20.0.70 Company: URS		
	RM	RS LO	GGN	VG S	UPE	RVIS	OR		-	Company: URS Project No.: GRZ10100.	
	APF	ROV	۱۲.						į		
Ĕ	8 8	18	92	35	Ž.	9.	AŞ	1		1	DATE
arto:		- E - E - E - E - E - E - E - E - E - E	ESS.		3204	84	S S S	250	8 E	Line Log	BEGIN 0837
	-	3.	0					F		•	0-3.3 (- //
	1	4.	.0				,				very dk grzyish brown 10483/2
1	1	- 1							- 1 -		fine-conse well-scaled
	1		1	- [ı	Ì		lil		43	1 2 3 4 2 9 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
			1		- 1					· · ·	moist [FILL]
	1	- 1	1	- 1	1	j		SW	-1-		المراجد ا
1		-	-	-		. 1		ŀ	4	1	
			3	3	1	.	- 1	-	-3-	•:1	
:	1			7			. I			//	33- 4
	_	4_	· A		1	.]	GC	7		5and Clayer gravel with
	4,0	3.7	C	٥.	1		T.		- 4		
	1	4.0	B		1		K	4	1		
·		1.0	ا ا				-	 	- 5-1		1,8600 Subs 0
·		1		1		- [ı	Ŀ	1		quartzite, dry.
4				1	-	- [Γ.			
		1	6.0	·			1		6	1	
	Ξ.			1	:			-	-1%		
		:]	1		L	7		
						- 1		-	1	#	
_	: .]		_	Į			.		1		
	8.0	,, ,		l			1	 	8-1/2		
		4.0						+		1	10-120 Clayey gravel w/ sent
		40			1.	1		L	a 1/	1	as above except yellowich red 5 TR 5/8 to white 5 TR 8/1.
1			·.		.	1			770	1	113/8 to white 5/R8/1.
			.					F .	4/	7	
NOTES	L 5: Ge	nerst 1	بر بي	le	4	4	٠.,	s follows	2/0	1_	
										Walaki	Procedure No. RMRS/OPS-PRO.101
	(2)	Cous po odaily t	roker (eaks	100 P	o be	irale to matche	otage	measur	stead of % ements not	poesit	le. Kevision 0
-130,0134	430y F-	GT IAM	lete etc.	-					waye IIPE	HIDING	mis not possible. Date effective: 12/31/98

1	,	\
•	Q	1
	~	1
	1	اد
	_ \	.)
_		

	ARS I	.OGG			RVISC					Sample Type: Ams PUAL TUBE
AP	PRO	VAL .			,			·		DATE
TOPBOTTOM OF CORE IN BOX	TOP/BOTTOM Of INTERVAL	FEET OF CORE IN INTERVAL (FIELD MEASUREMENT	SAMPLE	FRACTURE	BEDDING	GRAIN BIZE DISTRIBUTION	USCS	DEPTH IN	SOIL SOIL SOIL	SAMPLE DESCRIPTION
		. '					CC	10	/	
	<u>.</u>	·						_		
· .							·	-11-		
				.				 		
								- 12	/	- 1 4 GE
	120	3.7								- 12.0-16 de Clayey gravel with Sand, yellowish red 54R 57 cocrse, poorly graded, sub- gtaite, dry.
		4.0				:		_	9	cores south and of a sy
2		3 3 1						<u> </u>	0	state dry
·							. •			
		·					•	ıy	0	
								-15-		
		-	15.6 C		·		15/2		2	
	16.0		16.1				Ge	-16-	10	16.1-19.0 61-
		2.9	D				رل			de sia Full HIO
		4.0	16.6				7	17		olive 54 5/6, very stiff,
										slightly moist.
										LWEATHERED BEDROCK
								-18-		
							\bigvee	<u> </u>		19.0 - 20.0 TD NO RECOVER
]	ŀ				$ \Lambda $	-	I X I	

4.455

Groundwater IM/IRA - 903 Pad VOC Investigation

Area 3

Borehole Logs

1	ROC	KY J	TLA	TS I	ENVI	ROM	MEN	TAR		-	FORM PRO.101A
B	oreh ocati	ole N	umt	er.	CP3	8-0	11	IAL	TECHN(DLO	GY SITE BOREHOLE LOC PAGE
0	ate: ˌ	<u>9/3</u>	105	- 31	4/00	1E	ıst; _	Survey	d		Surface Elevation: Surveyed Area: 903 Pad
0	rilling	gist: Eau	<u>A.</u>	Pach	erpro				——————. ——————————————————————————————	:	Total Depth: 24.01
			_				-			1	Sample Type: Duci Tube Project No.:
A	MK: PPD	OVA	JGI V	NG S	SUPE	RVIS	OR				
ļ	1,	The Control of the Co	E	_	7					-	DATE
IE &	ilē,	185	38	ZE	35	23	I HE	-8	1	N.	
201		FEE	ĒŊ.	33	ğğ		Obsessor Streets	5 E	£.5	388	24454
	1	+	╬			 	B	<u> </u>	<u>o.</u>	5	SAMPLE DESCRIPTION
•			-			1	·	GM		41	0-4.0 Sand-silt -clay mixture with
ļ ·	'						ĺ		├ . -	1111	gravel gravel
		1	1						-1-		Reddish brown Syr 4/3
		1	1	- 1							Sidia- Caurse to med cut
		1	1	1		1					
	İ	1	1		{				_2 _	t111	Jupangular atzite (2.05:)
		ł	1	- 1	1		J	İ	- 7		[A1]
- 1			1		- 1	.	- 1	ı		1111	1
			1	- 1	- 1	.	- 1		-3-	1141	•
			1		- 1	. [- 1	1	٠	111	
			1		1		- 1	-	• +	111	
•	4.6		4.0	4	- [·.	- 1	5	_4_	Ш	
- 1			A	اء		j.	ħ	ફ્લ	1		4.0 - S. Gravelly Sandy Clay
- 1			j		- 1		1	<u>ጎ</u>		4	Gravel- Subang gtzite (6.1 in) poorly- compacted soft clay graded
	ı		l		- 1		- 1	 -	-s-V		compacted soft clay graded
.	- 1			1	- 1	- [sand-med-coarse gr. subrounded
			6.0		1.	1	I	上	72		reddish bown Syr 5/3
1			<i>9.0</i>	1			- [-	6-1/	<i>[</i>]	37K 3/8
1.	.			1:				ı		15	
1			7.0	ال	'	:}		·	7/2		
1			В		-			-	7-1/	// 1	-25 0
ı	- [7.5	-{		: [- 1		12		-7.5 PID = 1ppm
8.	0 4	1.0	2	1	-		- 1		72		soft
	\top	~			· [8 —		soft clay grading 1 into stiff
	-				-	j	- 1		1/1		1 8 9 3/11
						- 1	.	1	1/		
				1	ŀ	I	-		9 - V/1	8.	8-9.2 Sandy clay man = 0 col
		1	,	1	1	·J		1		10	grading into
1					ŀ	1		.	4//		8-9.2 Sandy clay outhgravel - 5% less 2 Gravelly Sandy Clay grand
		ــــــــــــــــــــــــــــــــــــــ		<u>. </u>	حبك		بال		0 /4		
1 25 :	Gone	erat (Male s	JSC: Mari	S is m	odfie	for thi	s log æ	s follow	8 :		Procedure No. RMRS/OPS-PRO.101
	(1)	adly t	roke	on cor	6, 2000	urate k	y % w	Mume k	e: refered of % remembs hol	weigh	Revision 0
	(4)	ane bi	reak	s can	not be	match	d, acc	urate fo	otage mea	SUPPITH	ble. Date effective: 12/31/98
	Offere	OT. MYO	JOL T	,	-						Page 27 of 28

	ROCI	YFL	ATS	ENVI	ROM	MEN	TAT.	Pom		FORM PRO.101A
0)ate: _	le Nur n - Noi 3/4/0 st: _A	_ ده	-0	8-0 4 E	91 Ist: _c	urvei	ed	OLOG	GY SITE BOREHOLE LOG PAGE 2 OF Surface Elevation: Surveyed Area: 903 Pad
D	rilling	Equip.	Po	ne co	cobe	-				Total Depth: 240" Company: ves
				SUPE		OP.	-		-	Sample Type: Dval Tube Project No.:
A	PPRO	VAL		T	X413	OK				DATE
88	8	829	1	12.2	88	A S	25	3 5	8	
Ş8.	ğ		33	100	₽¥.	3 8	25	8.E	E 5 8	SAMPLE DESCRIPTION
1	1						a	-	1	
	1	ļ					14	L _	1//	See above
	-								1/2	
Ì	İ		·						1	
120	12.0	4.0							1/	
		150		. [ı			- /2-		•
			- 1	- 1		l	- 1			
		- 1		- 1	:		I	` 1	1/2	
				1	: 1		·	-13-	//	
			-	ľ			Ļ	. 4	1/2	
- 1	.	1						,, }		
. 1	ĺ	- 1		j			Γ	-/>-		
- 1	- 1						· -	1	1/0	
. [- 1	.	. [-15-		
	- 1	- 1	- 1	- [L			
60 11	6-0	4.0	-].			Γ	7		
- 1			-		- 1	1		-16-1	%h	
	i		- 1		-1	- [.	-	1		
- 1		c					L	0		
- 1	-	V	الا (ا	ist Pu	sh					
			7			1	-/ -	-	$- _{\mathcal{R}}$	Refusal at 17.5 ft Offset 5! Drive solid
.			-			Λ	/ -	/x	///	point through atzit hung to solid
-	1			- [-	-11		- }	/	or pilothole from 175-21 CI
						1 1		7/	1 - 1	point through atzik byen to crush or pilot hole from 17.5-21.0 ft.
-		1	-1	1	i	-1/\	1	19-1/	W.	
- [1	- -	1	1		1.L]/:	V	
0.0 20.					1.	1	1 2	20 7 E		ł
OTES:	Gone	et US	CS is n	nodfie	for thi	s log a			٠ـــــ	
	(1) 8	idly bro	kon on	ee psur	TRICU I	y % w	xturne ir	stead of 9	welgh!	Procedure No. RMRS/OPS-PRO.101 Revision 0
	(2) Q	one bre	aks cor	noj bo	match	d, acc	urate fo	onego nije: Kotego nije:	x poesit isuroine	ble. ents not possible. Date effective: 12/31/98
1200134-12	OFFeen G	OLOHAL.	/G)	-						Page 27 of 28

ROCKY FLATS ENVI	RONMENTA	I. TECTIVO	FORM PRO.101A
Date: 34/05 Geologist: A Packer o		«veyed	FORM PRO.101A OGY SITE BOREHOLE LOG Surface Elevation: 5-rueyed Area: 903 PAG Total Depth: 21.547
Dritting Equip.: PorcaPo			Sample Type: Dwel Tube Project No.:
RMRS LOGGING SUPE	RVISOR		DATE
	PH HE.	. 5 2	· u
TOPPOTO POLICIA DE LA COMPOTO POLICIA DE LA	TONY OHOUSE		SAMPLE DESCRIPTION
21.0 21.0 -		1. 1	20.0-24.0 Slough
0.0		-21-	SolidPoint dove to 24.0 to crush
	1 1/	77-	L Dual Tube refusal at 21.5 ft.
	: /	-23-	
24.0 24.0 -		24	_
		-25-	
		F +	
		-26-	
		-27-	
		-28-	
		-25-	
		30	
OTES: Generat USCS is modified Materials amounts are justing (1) Badly broken core, tacc (2) Core breaks cannot be	mated by % volum	ne instead of % w	Procedure No. RMRS/OPS-PRO.101 eight. Revision 0 ossible. Date effective: 12/31/98 Page 27 of 28

Revision 0

Page 27 of 28

Date effective: 12/31/98

R	OCK	Y FLA	ATS E	NVII	RONM	ŒNT	AL T	ECHNO	LOG	Y SITE BOREHOLE LOG PAGE!OF
, ТВо	rehole	Num	ber: _	CF	238	-09	1		;	Surface Elevation:
Lo	cation	-Nort	th:	7 0	Ea:	st:				Area: 900-11 (903 Red).
Da	te:	<u> </u>	2 T	بك_ع	131100	(20)		<u> </u>		Total Depth:
. Dri	orogis illing E	c: quip.:	Z T	- 2	ing Sys	tem	AP-100	90_	:	Company: URS Project No.: GR210100 Sample Type: Split Span
			ING S	SUPE	RVIŠ(OR			,	•
AF	PRO	VAL				7		<u></u>	 -	DATE
TOP/BOTTOM OF CORE IN BOX	TOP/BOTTON OF INTERVAL	FEET OF COR ININTERVAL (FIELD	SAMPLE	FRACTURE	BEDDING	GPAIN SIZE DISTANDUTION	USCS SYMBOL	DEPTH IN	SOIL LITHOLOGIC LOGG	SAMPLE DESCRIPTION
										Advanced bombole without sampling via dual-wall reverse circulation procussion drilling with air (water added for dast supervision) from 0 to
	24.0			ļ ·	1		-	24-		angicality from 0 to
, <i>,</i>	24.4	0.4	D	.	·		&C			Coarse, subanjular, poorly gradel,
	25.0	X							ľ	
-	25.3	6.3						25		= 25.0 25.3 NO RECOVERY
		IX								
	26.0	0/0]					-26-		- 26.0 [No solt-spoon ponetation]
٠.										
	220			*		A	·	ー ኒフー		-27.0-27.5 NO RECEIVING
										- 27:5 STOP FOR END OF DAY 3/80/00
	:									3/31/05 NotD.OLL
										24' 45 0.1' PROVEY GE AT LAN
					: •			_		25-27' clay brown to grey 14 grants
		. "						<u>.</u>		Farnd, poorgrading: Stiff
			·				ā.			tight clay; day to damp;
					·	. 1			•	No Pid resting; No red reedings
			v.• t		v.k\$ 1	6				
		:		•			17-1 _m			
				^	· ·				,	
			[٠.		:	1		
·	•					,				
				· .			:		ļ. 1	
			·				•			
		L	<u> </u>							5
NOT	EC. C	ماممالد ش	LICO		PP: 11					D. J. N. D. M. COC DD C 101

(4011-430-0134/930)/Förnir GT.1A)(03/01-92)

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

	Ň	4
	7	ر
_		

Lo Da Ge Dri	reholication te: ologis lling E	e Num - Nor - 3 st: Equip.:	hber: 13.4/ N (A)	urvey	_ Ea	- 09 st: <u>-5</u> S	()		`	Y SITE BOREHOLE LOG PAGE LOF Surface Elevation: Survey Area: 900-11 Total Depth: 27' Company: UR 5 Project No.: Sample Type: Spit Troop
TOPROTTOM OF COPE N BOX	TOP/BOTTOM OF INTERVAL	FEET OF COPE IN INTERVAL FIELD	BAMPLE NUMBER	FANCTURE	BEDOING	GAMM SIZE DISTANGUTION	SYMBOL	DEPTH IN	SOIL LITHOLOGIC	SAMPLE DESCRIPTION
										24-24.5' o.1' recovery (GC) NOT bodry; no sample 25.27' clay, brown grey (54 %) Frind I poor 1720:ng SHIFF tight clay typical of Other bodry samples; lary O-PID reading No reds Gill spoor Samp 27' TD Semple collected 25-26'bgs CP38-091E See Status log 2nd logbook CHAR656
				is modi				_		

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0



	Boreho .ocatio Date: _; Seolog Drilling	le Nur n - No 3/3/05 ist: A Equip	nber: rth: <u>เว็พ</u>	CP38 weged	- 092 Ea: 	st: _ <u>s</u>			•	Y SITE BOREHOLE LOG PAGEL OF _3 Surface Elevation:Surveyed Area:903 Pad . Total Depth: Company:URS Project No.: Sample Type:dual_tube
1	(PPR				:				· 	DATE
TOP/BOTTOM OF CORE	TOP/GOTTOM	FEET OF CORE IN INTERVAL	MEASUREMENT SAMPLE NUMBER	FRACTURE	PEDDING	GANN BIZE DISTRIBUTION	USCS SYMBOL	DEPTH IN	SOIU LITHOLOGIC LOG	SAMPLE DESCRIPTION
8.0	8.0	4.0.	3.5 Avoc 5.5 Bvoc 6.0				Sh CL			0-35 Sand-silt-clay mixture inthograve reddish brown 5YR4/3 poorly graded sand-ned-cloarse subrounded quantz clay-soft, chightly moist glavel-0.05-0.1in subangular quantzete [Fill] 0-3.5 Compacted 30.4.0 Ho Recovery (compaction of -3.5-0.35'. Still 4' recovery.) Sandy Clay noth gravel pink 5YR1/4 sand-nel. to fine subrounded clay-soft, moist gravel-0.05 in subangular quantzete poorly graded

NOTES: General: USCS is modified for this log as follows:

Procedure No. RMRS/OPS-PRO.101

Revision 0.

Materials amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.

Date effective: 12/31/98

(2) Core breaks cannot be matched, accurate footage measurements not possible.



	Location Date: Geologophic Drilling	ole Nu on - No 3/3/ gist: _/ gist: _/	mber: orth: <u>\$1</u> o\$ Pack : <u>Pov</u>	CP3	8.097 Ea	z ıst: _ <u>.</u>		. :	•	Surface Elevation: Surveyed Area: 9/3 Pnd Total Depth: 21' Company: VS Project No.: Sample Type: dual type
L	APPE			3011	ACV16	<u> </u>			• •	DATE
TOP/BOTTOM	NOP/GOTTOM	PEET OF CORE IN INTERVAL	MEASUREMENT SAMPLE NIAMBER	FRACTURE	BEDDING	GPAIN SIZE DISTRIBUTION	SYMBOL	DEPTH IN	SOIL LITHOLOGIC LOG	SAMPLE DESCRIPTION
16.0		4.0					CL	- 11 - 12 - 13 14 15 18 19 - 18 19 - 19 - 19 - 1	1//	Sandy clay with grand as above Sold-increase to coarse substranded to medium grading inte Sandy Granelly Clay gravel- 0.1 in subangular quantzite dank gray SYR4/1 18.6 Granelly Clay as above 18.6 Granelly Clay as above 18.6 Granelly Clay gravel 0.1-0.15 in 5% bss sand; gravel 0.1-0.15 in 5% bss sand; gravel on grand grantite greenshigan Gley 15/1 10% bss Gravel
20.								20		19.3-20.0 Sardy Grandly Clay as above 16.0-18.6
NC	OTES: 6	enerat:	USCS	is modi	fied for	this log	as foli	ows:		Procedure No. RMRS/OPS-PRO.101

Materials amounts are estimated by % volume instead of % weight.
(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0.

' 2	1
1	ال.

) Bo	prehok	e Nun	nber:	CF30	5-076				LOG	Y SITE BOREHOLE LOG PAGE 3 OF 3 Surface Elevation: Surreyed
				veyed	Ea	st: <u>8</u>	uncy	ed e		Area: 903 Pad
l Da	ate: <u>.3</u>	-3-03	Pach	iro		•		 .		Total Depth: 21
Dr	illing E	Equip.	Por	erpo	be					Company: URS Project No.: Sample Type: duel tybe
	MRS I			SUPE	RVISC	OR				DATE
-	1.	ا روا	Ę I	T		z		7		DATE
TOPROTTON OF CORE	TOP/BOTTOI OF INTERVAL	FEET OF COS IN INTERVA	SAMPLE NAMBER	FRACTURE	BEDOING	GRAIN SIZE DISTRIBUTION	USCS	OEPTH IN	SOIL LITHOLOGIC LOG	SAMPLE DESCRIPTION
			20.5				a		1/1	Sandy Grandly Clay as above
1			Coc			1 .	·	- -	1//	
21.0	21.0	1.0.			·				1//	
			21.0]				21 —	1	Refusal at 21.0
·	ľ							├ -		on 314105 pushed 2nd offset 5' to NW.
	į								ĺ	Refusal at 18.5 ft.
					1			— 22 <u>—</u>	·	
		l	ļ .							
. • •							i			
•						· .		-23-		
						į				
					1					
			,		į	J		-24-		
					ľ	.]			. 1	
				1	. 1	• •			•	
·						- [- 25-		
	ı									
	j				. 1	1			Į.	
.		:				1	ŀ	-26-		
İ			·		, l '		ľ	_	. 1	
· .	·		}					- 1		
							- 1	-27-		
		. 1								
1	ŀ			- 1			ı			
.	1			.			. [_28_	·	
	·	1	-							
1	ł	1	1		.		F		1.	
		:		.	- 1			_29_	-	
1			1				Ţ	-01		
1		.			·		-	- 4		
	· <u>·</u>					- 1		.30	- 1	
NOTE	S. G.	necat	IRCE	is modif	Fod for	bio los			<u> </u>	Procedure No. PA/DS/ODS DPO 101

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0.

Date effective: 12/31/98

. Dr	te: ologis Iling E MRS L	t: quip.:	ک ۱ لمحم	(-D	r.1/5		AP	~100D	(Total Depth: Project No.: 68210100 Sample Type: Select Select No.: 68210100
AF	PRO	VAL			·	· 				DATE
TOP/BOTTOM OF CORE IN BOX	TOP/BOTTOM OF INTERVAL	FEET OF CORE ININTERVAL (FIELD MEASUREMENT)	SAMPLE	FRACTURE	BEDDING	GPAIN SIZE DISTRIBUTION	USCS	DEPTH IN	SOLV LITHOLOGIC LOG	SAMPLE DESCRIPTION, Besin 3/30/05 1030/18/12/45
	25.0 25.0	1.0	27.0 27.0 27.0				\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- 26		Adviced bordele without sampling via dual-null, reporse-circulation procussion dual-null, reporse-circulation procussion dualing From 0 to 25 ft (3 purification) to sample as individual below 25-26.4 No recovery 250-2505 Clayey gravel, 250-2505 Clayey gravel, 250-2505 Clayey gravel, 250-2506 (10) to 37/2 Coarse, foothy sreded, enbround, wet, glaite, moist. - 27.0 - 28.0 Clay, gray (54/5/1), WEATHERED DEDROCK 28.0-28.5 NO RECOVERY

General: USCS is modified for this log as follows:

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Procedure No. RMRS/OPS-PRO. 101

Revision 0

Date effective: 12/31/98

	Date: Geolo Drillin	ogist:	vip.:	1 65 M Bu	DWI DWI 1007	Ea [st: <u>Su</u> Log	ral ·	TECHNO)LO	GY SITE BOREHOLE LOG PAGE Of 2 Surface Elevation: Survey Area: 900-11 Total Depth: Company: URS Project No.: Sample Type: Macro Cove
	APPF			ING	SUPE	RVIS	JR		·		DATE
TOP/BOTTOM	IN BOX	OF INTERVAL FEET OF CORE	IN INTERVAL FIELD MEASUREMENT	SAMPLE	FRACTURE	BEDDING	DISTRIBUTION	USCS SYMBOL	DEPTH IN	SOIL	SAMPLE DESCRIPTION
			Ì								
	W.	4			·	·		• •	- -2-		F: 11
									-3-		T'
	2/2	ey.(ŝΜ	- - -		lays 7/4 Subangular Sittlewavel 1000/ > 3cm Very Palebrow , O.O.P.D.m
	Υ,	6.0					C	'n	- 5-	8	Course poorly ported Course poorly ported Corryly Siltleravel C.Oppm Same as above
	Yı	7.0	,				5	M			10418/2 porsorted-med Very Bale Brown Subaugular 5:14/5 and gravel x1-2cm 0.0 ppm
	2/2	9.0					Şi	M	-8 -8		logr 8/1-8/4 Poor sorted - med White +0 very Pale Brown Silt/Sand Gravel Zcu - 5ch O. Oppm Subangular
NOT	Ϋ́I	10					GI	يل	0	6	same as above o.uppn
1401	ES: G	eneral	: US	CS is	modific	ed for th	is log a	as follo	ows:		Procedure No. RMRS/OPS-PRO 101

Materials amounts are estimated by % volume instead of % weight.

(1) Badly broken core, accurate footage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.

Revision 0

Date effective: 12/31/98

Bo Lo Da Ge	rehol catior te: ologi	e Nur 1 - No 3/2 st:	nber: rth: <u>\$</u> 165 M.B.	WVO	Ea	593 st: <u>\$4</u>	Wey	· · ·		Y SITE BOREHOLE LOG PAGE 20F 2 Surface Elevation: Survey Area: 900-(1 Total Depth: Project No.: Sample Type: Macro ore
		LOGO		SUPE	RVIS	OR				DATE
TOP/BOTTOM OF CORE IN BOX	2	### #	SAMPLE NUMBER	FRACTURE	BEDDING	GRAIN BIZE DISTRIBUTION	USCS	DEPTH IN	SOIU LITHOLOGIC LOG	
	42	12-					599L GM	 II	al d	10 yr 1/4 davlt yetow from 1 sitt sand west road of ppm logs 1/4 light yellow brown 0.0ppm Subangular silty/gravel gravel > 3cm foor sorted med
	4	Ħ i.u.					GM	-12 -13 	10 to 60 to 10 to	Silty Igravel gravel gravel > 3m Poor sorted-med 0.0ppm loyr 6/4 light yellow Brown Subangular
	42	+6					3M	-14- -15- 		Same as above O.Oppm
2	1/2	14				6	5M	-		Same as above 0.0ppm
	4	19				G	M	18-1		Same as allove 0.0 ppm 19 TD ratusal (San A Rachero Instantial
 IOTES	Ma	terials	amoun		stimate	d by %	volume	ows: e instead of surements i		

(2) Core breaks cannot be matched, accurate footage measurements not possible.

ROCKY FLATS ENVIRONMENTAL TECHN Borehole Number: CP38-093 Location - North: Surveyed East: Surveyed Date: 3-3-05 Geologist: A.Pacheto Drilling Equip.: Power Robe	NOLOGY SITE BORIEHOLE LOG PAGE 2 OF 3 Surface Elevation: Surveyed Area: 903 Pad Total Depth: 30 Company: UKS Project No.: Sample Type: Dual Tube
RMRS LOGGING SUPERVISOR APPROVAL	DATE
POSCORE INTERVAL INTERVA	y l
	10-19'- See alternate boring log from 3-2-05, Geologist: Mark Brown Frote this log begins with Page 2
19.0 19.0 BEGIN -19-CL 20	19.0-19.7 Gravelly Sandy Clay (compacted Sandy Gravelly Clay (19.0-21.0) Slough) Sce description next page 19.7 and one see mext page topy yos
NOTES: General: USCS is modified for this log as follows: Materials amounts are instituted by % volume instead (1) Badly broken core, laccurate footage measurement (2) Core breaks cannot be matched, accurate lootage	ents not possible.

		ROC.	KY FL	ats e	NVD	ROM	MEN	ral :	TECHNO)[()	SY SITE BOREHOLE LOG PAGE 3 OF	
•		Locati	ole Nun on - Noi	nber: th: Su	CV3	5-09	3				Surface Elevation: Shiveyed PAGE 3 OF	3
	-	Cate;	3-3-	<u> </u>			ıst; ş	uncy	- 0		Area: 963 Pad	
	ı	Geolog	gist:/	1. Pach	uo.				 .	;		
		Ormang	Equip.	-661	OPT	(IST P	ush)	Powe	APabe (p	/bns	Company: VKC Project No.:	
		RMRS	LOGO	ING S	SUPE	RVIS	OR	***	- '	ر بادی	Sample Type: Dul Tube Project No.:	
	L	APPR	OVAL							i		=_
	ž.	12	. 2.		T	7	F	7	7		DATE	
	Ĕ	3 5 3	\$ 18£9	75	3 2	27	BE	25	3.	8		=
	188	1 8	FIEE	33	15 E	100	2 6	200	8.5 8.5	588	SAMPI S DESC	
	-			-	<u> </u>	<u> </u>	o B		δ.	1 5	SAMPLE DESCRIPTION	- 1
	į	1	1	·		İ		CL		11/	19.7-22-6	j
		1	\cdot					1	<u> </u>	1//	19.7-21.0 Gravelly Clay with Sand Acp2-3	\overline{a}
•	21	0 21.0	120						· -	///		
	j				- 1				-21-		21.0-22-0 San By Clay with framel	- 1
					1					//	23.0	- 1
to P	- 22.	22.0	2.8	- 1	- [- 1	1		- 7		1st foot compacted slough from above	H
3-3-0	5	1	15.0	. [- 1	- 1	ł			//	Hok collapsing above	- 1
	1	1	1 1	}	٠ ا		٠ ا	1			Redduh brown SYR4/4 to reddukgray	- [
		1	1 1		- 1	j	- 1	· •	- 4	//	19 (GALLY UCIDAL SYRII) C. in El	
	23.0	23.0	3.0	- 1	- 1		71	- 1	22	12	SARA CORRE to head out and a books and	4
	1	ı	1 1		- 1	·	르	·	-13-1		gravel - subangular, quantzite (OOS - 0.1 in) 23.0-25.0 Sanly Gravelly clay as above	1
•	1 .	1	1 1	ł	- 1		ı	L		10	Saturated with water at 23.0'	1
•		İ		- 1	- [.	- 1	ſ	7	3300	Due 1- 100 C	1
	į	1		- 1	1		i	-	-24-1		Due to presence of water, hole has	ł
	1.	1		- 1			i	- 1	- 1		collapsed. Will push 2nd hole with another rig (Power Probe) beginning at	1
	250	25.0	30	- 1		- 1	- 1	一上	·		23 ft with 36 for	
			-	- 1			- 1	L	-25	الوجو	23 ft with 3/ foot intervals	1
	1	1 1	j				Image: Control of the control of the	V	-ω - κ	$\langle \mathcal{A} \rangle$	24.0- op2.2-05.	
-		i i	i		- [[K	\searrow	- 4	刁,	25.0 - 255 No Recovery	i
	1	1 .1			·	J		L		// 2	15.5 - 27.0 Savely Gravelly Clay	1
	1		İ			- 1		F	-16-17		, ,	l
	f				- 1	ı						
P _	1220	27.0			1	- }		٦				
کص		2:. 4	В	\dashv	_			<u> </u>	-27_	/],	20-225 C. O 4	l
	1 1	- 1		DC 116				- 1		71°	10021.5 Sandy Clay with Gravel	l
	1 1		c				-			4,	7.5-30.0 Silty Sandstone	
	24.0	280	\	0C 10 Spl	(F)	1	.]	j	Hil	1:116	Silty Sandstone	
	1			一 '			- 1		28-11		mod. stance and total man	
•				- 1	1	- 1		L	111]]	mod. strong, completely weathered dark gray Gley14/1	l
	1					1	.	Г	7.11	-1:11	care gray city 14/1:	ĺ
		- 1	ı	- 1	- -		-	+_	29	1 28	5.7-30.0 No Recovery	
	-	-		1		•	- 1	1	N.	NI `	- Concovery	
				1	1.	1	1	H	-11X].]	• •	
	30.0	30.0 C	7.7						30	N~	× 20 -	
	NOTE	S: Gen	erat; US	CS ls =	nodific	d les st				110	20.0	
Ī		14 ACES	auena ent	COMIS 8	V 8 8511	TIRIAH I	W 4 C	4	معامي فيتحمده	! sace! _ s	Procedure No. RMRS/OPS-PRO.101	
الخدرية		(4)	nole Die	exs can	uot pa	match	ed, acc	urale f	ootage me	surem	ents not possible. Date circulive: 12/31/98	
1.	4011-120-013		GT. MAYONO								Page 27 of 28	

Groundwater IM/IRA - 903 Pad VOC Investigation

Area 4

Borehole Logs



RMI	RS L	OGC		New Pro	RVIS	OR		-	+	Company: VICS Project No.: Sample Type: Dvc Ubc
	PROV		75	3 3	22	11	S TO STATE OF THE	2 2 5	- W	DATE
18	-		32	1 5 3	1 2	å g	1	8.5	300	SAMPLE DESCRIPTION
4.	o \}	4.0	5.0 B	+FD +VER			GM	- 3 - 3 - 4 - 5 - 3		0-30 Sand-silt-clay mixture vi/go DarkReddish brown 34R + 1/2 3/4 Sand- medcoarse subaunded sand clay-soft, slightly moist- gravel-poorly graded, subang. 912 [Fill] (0.1ii) 3.0-12.0 Sandy Gravelly Clay Reddish brown SYR 4/4 Clay-Stiff, slightly moist- gravel-subang. 972ite, poorly-go sand-coarse-med. substanded 912
<u>8.0</u>) 1.0		0.0					8 7 7		5.6 -8.0 No Recovery 2nd Push Required to obtain full Sumple volume See above, 3-12.0

14011410-0134-9100Fees GT.LAX03/01/473

ł	ROC	CKY	FLAT	SE	NVI	RONI	MEN	PAT.			F	ORM PRO.101A
ŀ	Bore!	hole N tion - 1	fumbe North:	sur	2038	3-082 d_€	2.	- ^ -	ECHN(DLO	GY SITE BOREHOLE LOG Surface Elevation: Surveyed	PAGE Z OF Z
	Date:	3/4	103 A.			7	IST: _S	urvey	co		Area: 903 Pad	
	Drittin	vyisi. 19 Equ	بان: عادر المانات المانات	Pon	ero UPn	o be				. :	Total Depth: 20.0'	-
Γ			_			RVIS				<u>;</u>	Sample Type: Dunt Tube	ject No.:
L	APP	ROV	AL _		Ore	V A 120	OK			!		
ğ	, 2	₹ 8	1.6	J'E	,	T	1 8	T		,	DATE	
È		8 6				ğğ		10 S	4.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2	8 €	g	
F	- 1	- 10	<u> </u>		<u> </u>		8 8	3 %	8.	× 6 ;	SAMPLE DESC	RIPTION
				- 1				CL		111	South Court C	
	1							'			Sandy Gravelly Clay, a	abore
	1		-						-/-	1//		
			-1	- [- 1					1//		
12-	0 12	0 4.	0	- 1	· ·					//,		
	1								-12-	1/		
								.		//		
		1.	-	-	′	- 1	- 1	- 1	-13	1/	,	
٠.					`	.						·
		1	1	1		:			7			. 1
						•	. [-14		•	
						- 1		H	. 4	1	14.9-15.3 Sandy clay, 5	To less grand
		1		1.	- 1		- 1	Ŀ	_/ </td <td></td> <td>5.3 Sudy transly clay</td> <td></td>		5.3 Sudy transly clay	
	1		1			- 1			,		as above /	
6.0	16.6	4.0		1	.	- 1		<u> </u>	· 1/2			
			1	1	1	- 1	- {	-	-16-19		· · · · · · · · · · · · · · · · · · ·	1
٠.	i		16.7		٠ [.	- 1	- 1	L				*
		. :	Cvoc	1					12			
			17.2	1			-	-	·//	21	17.2 Silty Candeton	
		٠	Dvac 17.7	1		-		-	-13	11k	17.2 Silty Sandstone disregard clay log 179-18.2	1
		:		1 .	1.		-	-	18-17	扑	179-18-7 10g 1/2	' 1
					1	- 1	.	·L	ľ		Are3/4/05	
			1			- 1	•	٠ ٢		H		
					1	1	1	+	19-17	捌	, , , , , , , , , , , , , , , , , , , ,	
				1	1	-	-	1	-18	H		
-	20.0	·			_ل_	سالم			20 7	91-	TD=20.0	l
OT	ES: Ga M	deret denet	USCS	is m	odfie	d for th	is log s	s follo	ws:			S/OPS-PRO IAI
	(1)) Badi	y broke	n 001	re, tack	wate (by % v	otime i moási	rs; instead of irements in	K weig Of pass	But"	Revision 0
-					uol pe	match	od, ac	curate (ootage me	asuro:	relbie. Thents not possible. Date eff	ective: 12/31/98
430-Q	MAXWE	MLTD IN	HONOF42	,						-		Page 27 of 28

	R	OCK	(Y F	LATS	ENVI	ROM	MEN	PAR .					FORM PRO.101A	
	B	oreho	le Nu	mber:	_ CC	38-	- 69	3	TECHN(DLOC	Y SITE BO	REHOLE LOG		_
	1 5	ocatio	n·No	iniber: orth: <u>Sy</u> os	rvoyed	E	est s	ururu	-	:	A ALIENCE CHEVI	TION . Suma	PAGEOF	
		ale: _	31:11	05	e Cours				<u>u</u>	•				
	Dr	illina l	5r. 7	Pach : Pov	eto (9	27	471	<u> </u>	:	Total Depth:	26.0 FT		
į			- 100	- 100	2010	DE .				1	CONTRACTOR TO	/KS	rojeci No.: <u>GR2/0</u>	
	RI	MRS	LOG	GING	SUPE	PVIC	ΛÞ.			-	ample Type:	DWO TUBE	10100 110 <u>GC 278</u>	100
ı	AF	PRO	IÁVC			V 412	UK			:	•			=
	-10	1,		El			*****				DATE	•		,
ŀ		lE.	1829	3 2 1	Ž.	0	W &		1	T		10 10 10 10 10 10 10 10		
A		180	PE	51. \$ 3	Ę	188		SE	Ì	≥8.	1 .			<u> </u>
ľ	m	2 *	22	31 - 2	£ .	184	186	5 E	£.5	18 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	12	SAMPLE DES	SCDIOTION.	- 1
1	40	1	7		<u> </u>		 - -			.5	Begin	0852	SCHIP HON	
- [4	3/2	2.2		l i			. نے ا		•	0-7-	- 00 2		
ı	0	47.0	/	1				Į-	<u> </u>		0-3.2	Gravelly	sand	
	۱ ا		42	1	i i				•	•	dkre	(4), med-co	<u>)</u>	
1	1		,	1 1				, 1	- 1-1		1/3t =	as so so so so	un (104 R	
	- 1	•		1 1		. 1	1	1			7 3/	4), med-co	arse well-	1
1	ł]		1 1		- 1	- 1	~ }	- 4	•	الإياء	cd Subroun	D cuta	- [
ŀ	1	- 1		1 1	- 1	ŀ	1	SW	1		31.64	12 moist	- 1 Such E	- 1
1	.	- 1		1 1	•		- 1	• · · · }	-2-	. 1		7	LFI LLJ	-
	- 1	- 1		1 1		- 1	- 1		_ 1					-
ł	٠ ا	- 1			- 1	. 1	- 1	Γ	7. 7	•		•		-1
1		L	2	3.2	- 1	. 1	- 1	L	_3_1	•		i.		1
1					ł	.	r		- ا	//	2.3			-
				A			.	ļ.,	. 49		302-40		,	
-	-1	4.0					- 10	SC			pron-	trust Clare 4/2 clare 4/2	rey gravel	ı
ı	B	61	1.0	4.0		.	- 1		=4 -4 4	ZI.	_ Coars	e wall a	3, 0	
t		KII	Ì	l.	•	•			' la	A	A Subro	made	ded,	
	Y	. 4	- 1	BI			10	W	-0	ZN,	40-70	2, 5, 5, 16	dy.	1
ı		90' I .	ار		ı		- 1	j	Y2		ai .60 5	andre or al	LII	ŀ
ľ			2.0	- 1	1	- 1		-	-5-19	U s	strang	brann 25	WITH Clay	1
	1	1	40	- 1	.	- 1	I	- 1.	YA	W	Course	table of	Q 5/6,	
			- 1	- 1	- 1.			Γ			6 6+2.+	1 wallegran	with clay, of 5/6, ded, subson	1
	-1	29	ØL.		- 1	- [t	L	$\mathcal{L}_{-}\mathcal{L}_{1}$	ar.	Etaite	, ary.		ľ
	1		<i>?</i> V .	6.0	- 1:		- 1			7] :			•	•
	. [j		- 1						1 2		•		ŀ
	1	- 1	- 1	j	· [1	- 1	·	1	1	•		
	1	1		- 1		- 1	+	4-	7-14		0-800 N	. , .		
		-		- 1		- 1	N			17	0 - 8 0 V	lo racorary		
٠.	l	١.	1		- 1	ı	-1/\	\ -	-4X		•)	,	
	84	O		[V	V	/	11				
	Γ	14.	مار	- 1	٠,			-	8-1-	4				
0.	1 .	1	7	- 1	. [1.		1	•	1 8	0-12.0	Sondy grave	1.41	
		4	اه	1.	1		10.	.	4	٦	(A) 4 0-	Soundy grave	" WITH CIRY	
,		1 "	٦	- 1	1.		G	M	_ •	1.	Cas A.o.	". b) .		
	Ì			٠ (1	1	+-	7-1		•			
	1		1	1	1	1		1		1	•		1	
	1	1	1	.	1		1	Γ.	. de	1		•	1	
	سخا	ب	1		سبك	_نيان		L	والم				1	
NOT	ES: (Genera	t US	CS is m	odified	for this	loa se	follows						
										walshi		Procedure No. RM	RS/OPS-PRO.101	
		(1) Dăi (2) C~	aly bro	men co	e, lacci	irale to	otage n	1685UN	slead of % ements not	DOSSI P	le. ·		Revision 0	
	,		- 40	CSU	uot pe t	matche	d, accu	rate fo	otage meas	ureme	le. nis noi possible	Date el	Mcctive: 12/31/98	
14100	434-430y	Form GY,	OTOLY	ات									Page 27 of 28	

	B	OCI	CYF	ATS!	ENVI	RON	MEN	PAR 6		-	FORM PRO.101A
	B	oreho ocatio	ie Ny n - No	mber: nth: <u>Sv</u>	0	<u>38</u>	- 0	83	ECHNO	LO	GY SITE BOREHOLE LOG PAGE 2 OF 2
	O	ale: _	3/7/c	25	MACA		1 5 1; _S	urvey	a_	٠.	Area: 903 Pad
	Ö	rilling	ы. д Equip	·Pach · Pov	eco.	be	-			:	Total Depth: 20 FT
		, .		GING			OB	. · · · ·	-	-	Sample Type: Due Tibe Project No.: GRZ1016
	A	PPR	DVAL			V 419	OK			:	
	10	P	10 E	9 45	2		m 8		T	÷	DATE
S)		88	OF.		100	1 8 3	1	2 2	£ 5	₹ §	
	ff	-	2.	-	-	-	3 8		8.	רשאל	SAMPLE DESCRIPTION
- 1							1	cw			
- 1		•	l					Ç.V	٠. ٦	•	
- 1						:	, ,		-u-	•	·
1				1 1						•	,
H		12.0					7		_ ,	#	
Γ	0		12.8	120	·		•		-12	: 🛕	(2.0-24.0 < 1
1	۲					.	- 1		⁻. ┥,	ر ن	resolute with clay
1	- 1		6	C	- 1		. 1	- 1	-13-	•	Coarse well-star D. D.
	:						-	-			quartzite dry subromy
		40				:	. 1	L	14		12.0-14.0 Sandy gravel with clay, Fredish yellow 5YR 5/6, Coarse, well-scaded, subround, guartzite dry, [14.0 REFUSAL LOFFSET 3'W FORZ-Patter] SOLID PT TO 14.0, THEN SAMPLE
1.	,	2	14.0	140	1		I		-		1 111-1 700 110
1	1						- 1		· 1	•	Yellowish red 548 -1
1	ľ	1.0	- }	- 1				r	-15-16	•	14.0-16.0 Sandy gravel Yellowish red 54R 5/6, Coarse, well-graded, subrand
			- 1		- [- [-	- 4	-	quartoite, dry aded, subrand
 		40	60	- .			1	-	16-18		
0	,		7 '	- 4	1	- 1.		ŃĹ	10		16.0-16.5 NO RECOVERY
	1		4.0	7.0							16.5-17.85 Se-ly sound with clay,
	1	- 1	* 0	D	-				17-18	1	as 14.0 16.0.
			-	25				+	-	計	17.5-20.0 Clay, Stownshyella
			1,	80			C	L -	18-	1	1048 6/6 to dive on sych
	.	-	1				1	.L		4	very st. FF, slightly moist.
l		ı		- [.	1		1	INFATHERED BEDROCK?
	1				l.			-	19-7	1	
	1	-						+	1/	7	TPIDES
	1	91.0	+0		با-		بل		آلوم	1	200 T.D. [PID scens = 0.00pm]
, 140	· c3:	***		SCS is a			No. 20	ab 1	d - d		Procedure No. RMRS/OPS-PRO 101
											nt. Revision 0
40141	20124						70, acc	WI = 10	vorage mea	SUPOR	hents not possible. Date effective: 12/31/98

K	UCKI	FL	ATS.	envi	RON	MEN	PAT :			FORM PRO.101A
Da Ge	te: <u>.3</u> ologisi	1 0 A	5 Pact	CO irvoyed cto flo		-0 lst: <u>s</u> 2-7	urvey	<u>a</u>	:	FORM PRO.101A FY SITE BOREHOLE LOG Surlace Elevation: Surveyed Area: 903 Pad Total Depth: Company: URS
				4 4 4 1	RVIS			==	<u>.</u>	Sample Type: Duri Tibe Project No.: GR21016
AP	PRO	/ÅL		JUFE		OK			:	
,	ğ ,	88.		T.	T.	1 1	T .		 -	DATE
88	TOROG S	2.9	3	100	- Prove	CHANGE	\$250 \$4.5 \$4.5 \$4.5 \$4.5 \$4.5 \$4.5 \$4.5 \$4.5	# 44.55 1.55 1.55 1.55 1.55 1.55 1.55 1.55	2000001 7800	SAMPLE DESCRIPTION
8.0	0 4. 3. 74.	4.0	2.5 A 4.0 B				FILL SW CL SC	3-4-5-6		rery derk sreyish brown love the fine-course, well-greated, subround that fine gravely clays yellowish rad 542 4/6; stiff, sightly moist. TFILL J. Strayelly clays yellowish rad 542 4/6; subround, stiff, sightly moist, with clays yellowish rad 542 5/6 to pinkish gray 7.542 7/2; coarse, well-sredd, subround, stift, dy. 8.0-12.0 Sa-Jy gravel of clay, subround, stift, dy.
(1) Bage	y brot brea	ka cau	te jaco	I for this mated b urate to matche	y % vol	tume in	stead of %	weight, possibi	Procedure No. RMRS/OPS-PRO.101 Revision 0 Date effective: 12/31/98 Page 27 of 28

R	OCK	YFL	ATS	ENVI	ROM	MEN	TAL	TECTIVO		FC	PRM PRO.101A
G	ate: cologi	\$1710 \$t: ★	Puch	ers s	9 -		84 urvey	<u>eu</u>	OGY SITE BOREHO Surface Elevation: Area: 903 Pm Total Depth: Company: URS	Surveyer	PAGE 2 OF 2
RI	MRS	LOGO		SUPE		OR	- '		Sample Type: Dua	Tube Proje	CI No. GR210160
AF	PRC	VÁL	=						- DATE		
A CONTRACT	Tonsorto	10 mm	See See See See See See See See See See	PACTICAL	O TON	DETAMONO	SOS S	PERTY IN	g ·	AMPLE DESCR	IPTION
	(2.00	2.7					GC.	12 - 13 - 9	gravel, pal strong brow coarse, in strite/de to moist	is: Clayer & colive 54 in 7.5 yp rell-scaled inte dry	578, sub-ou-d,
		1	ر الا			C		15-16-17-18-1	- 17.5 - 18.6 Co lisht olive brownish ye Vary St. FF INFATHER 18.6-20.0 A	llay, gray 54 llaw 1048 l slightly	6/2 and 6/8, moist.
•	(1) Ba	dly bro	ken oo	nodfied re jestin	HEIGH F	y % vo	kume in	istead of % wel	20.0 T.). Proces	dure No. RMRSA	RY
10.01.14.10.01				noi be	matche	d, acc	urate lo	otage measure	sible. Ments not possible.	Dato effect	ive: 12/31/98 Page 27 of 28

ogist: genip rig Equip RS LOG ROVAI	Pazl	eto ;	RVIS	2				FORM PRO.101 TY SITE BOREHOLE LOG PAGE 1 C Surface Elevation: Surveyed Area: 903 PA Total Depth: Company: URS Project No.: GRAU Sample Type: Dull Tibe		
HOVA TOTALLES WASSESS 2	SAUPLE, MANUEL M	Te	9	OR	-		+	Sample Type: Durl Tibe Project No.: GRAL		
HOVA TOTAL STATE OF THE STATE	SAUPLE, MANUEL M	Te	9	T.F			:			
-	THE STATE OF	Mende	22				1	DATE		
-	2 23	1 3 4			25	2 2 5	. 8			
-	, ,	+	§ å	3 8	2080	8. E. E	190 E	SAMPLE DESCRIPTION		
1	1				F		•	0-3.0 (= 11 0		
40					1		7	Very dk scaresh brown 10483/ Fine-coarse, well-scald subround sta		
					7	-1-		Fine-coarse, well-graded		
			- 1	1	6.1	- 4	۱' ۱	subround, ste, slighty moist. [FILL]		
-		. 4		- 1	$\mathcal{S}_{w_{1}}$	-2-1		EFILL7		
-1		·		1		`] [,]	1	4		
		ŀ	: 1	- 1		7.	1			
	3-0	J.	.			-3	Ä	3.0 - 7.5 Clayer grand wy sand		
1 1	A	~~ .		10	^r Cf	/	6	strong brown 7.5 100 =10		
1-1	40			-	-	-Y -	1	coarse will are dell sil		
38	. 1	- 1	- 1	"	L		X	white any Grades to		
4.0	B		1	- 1	Ĺ			strong brown 7.5 pg 5/8, coarse, to the grades to white 7.5 pg 8/1 from 6.5 to 7.5		
		- 1	-			37	1.			
	- 1].		- [r		1			
1	0.0		- 1		-	6-16	1			
	-	. .	-1	.	-	1/	1			
		1.					1			
' .	- [.		-		1		1			
•		-				7/	<i> </i>	7.5-12.0 Clayer grave/with 1		
4.0				(6)	4	8-0/		strong brown 2542 5/6 matel 1		
		1.	1	1.	+	4/	1	5trong brown 2542 5/6 notell with light dwe gray 54 6/2, dry. gradel, subround, Et zite		
7.0		:	1					dry' subround, Et zite		
	1	1.		Ī		\sqrt{V}] .			
	.	1			1	7/0/	ľ			
verat US	CS k n	nodificat	for the	- 	4-4	0 1/0		Procedure No. RMRS/OPS-PRO.101		
	4.0 4.0	4.0 B 4.0 B 4.0 4.0	4.0 B 4.0 B 4.0 B 4.0 B	4.0 B 4.	4.0 B 4.0 B 4.0 B 4.0 B G G G G G G G G G G G G G	3.0 A GC 4.0 4.0 B GC GC GC GC GC GC GC GC GC GC GC GC GC	4.0 B 4.0 GC	38 4.0 B 4.0 C		

R Bo Lo	OCK wehol cation	Y FI le Nu	Mber: orth: <u>Su</u>	ENVI	ROM S7	MEN CO	FAL	ECHNOI	OG	Y SITE BOREHOLE LOG PAGE 2 OF Surface Elevation: Surveyed	
Ge Dri	ologi lling (st:∠∆ quip	os .Pacl .: Pov GING	eco s		2	2	TUFA		Area: 903 Pod.: Surveyed Total Depth: [8.0:7] Company: URS Sample Type: Dull Tibe Project No.:	
AP	PRC	VAL		JUE	K A 12(UR		-			
	ğ 3	810	g e E	12	T	иš			=	DATE	
9 1	OBPOT PATER	OF STREET		PROTU	OG T	O Passed	5 5	E E	1000	SAMPLE DESCRIPTION	
-	;						GC Br				
1								- II -			
4	12.0	12.0		•		- 1					
		A		`			se		1	12.0 - 14.5 Sandy gravel of c yellowish rod 5485/8 Coarse, poorly graded! subround, atzite, dry.	
1		2.5			:			_6_]/		Coarse, poorly scal	
	į				.					subsound, ote, te, dry.	
		1	-:1					-14-1	9		
14	1.5	-	, J.	- 1					1_	· · · · · · · · · · · · · · · · · · ·	
1	1/2	.6	15.0		1.	-	L	15-17		14.5-15.5 Sandy gravel of clays	
1.	3	5	5.5			-	-		1.	55-171	
1.			Dr		- [C	4	16-11	1	25-17.1 Clay, Olive yellow with gray 2.5 y 6/1 Very stiff slightly moist. [WEATHERED BEDROCK]	
		'	6.0		1		+	1//	1	with gray 2.5 4 6/1	
				-	1	L	_}_	17-1/	1	WEATHERED BEDROCK 7	
-			- [$ \rangle$	(-	-	1 "	? 1- 18-0 NO RECOVERY	
(8.	-	-				/ -	+1	8-1		18.0 T_D	
					12		+	4			
				1			1	9-1.			
•**						1	-	4 1			
:S: 0	Senera	t US	CS is n	odilad	for thi			الما			
i	(1) Ba	ily bo	Trans	ro psun	nated 5	y % vol	lume in	stead of % we	lght.	Procedure No. RMRS/OPS-PRO.101 Revision 0	
	(2) Co.			noi be i	matche	d, accu	rate to	otage mpasur	omei Paroi	e. Revision 0 its not possible. Date effective: 12/31/98 Page 27 of 28	

		ROC	KY	FLAT	S ENV	RON	MEN	TAL		<u> </u>		FORM PRO.101A
		Date: Seolo	_3/ <u>-</u> glst:-	105 A-Pa	r. CC Surveye checo-		0 asi: s	urvey	TUTA	:	Surface Elevation: Surveyer Area: 903 Prof Total Depth:	PAGEOF_2_
	•		_		G SUPE	100				i	Company: <u>URS</u> Sample Type: <u>Dull Tube</u>	Project No.: GRZL0100.
	. A	PPF	10V/	L	0 30rt	KVIS	OR	·			DATE	
	8		18	39 2	E 32	27	H &	28		×		
	6.8	1 2		\$ \$ £	A SEA	100	Office and office of the offic	SE	8.	100	SAMPLE DE	SCRIPTION
			2.	8				اجرب		• •	0-30 Grav // A	
			4	6				Sw	- 1 -		0-30 Gravelly sand very OK grayish be fine-coarse, well- subround, guar	1048 3/2 grade 0
											Subround, quar Moist [FILL]	to, slightly
ľ				3.0				F	- / -			
		١.		A		:	T,	GC	-3-		3.0-43 Sandy 100	val th. d.
	+	40	3.0	4.0	1			}	-4-		3.0-43 Sandy gra Strong brown 7.5 Coarse, well-grad.	YR 5/8
			4.0	0				L			N,	o, substand,
				D				+	-			
				6.0					6			
								-	7-0			
								†				
•	8	0 3	4.6					-	8			
. •				:			1	+	9-10	- 9	.3-10.8 Clayer gran	
• • • •	<u></u>					1.		$\int_{-\infty}^{\infty}$	16		Coorly graded subround	\$/6, conte
NO1	TES:	(1)	Bactly I	Milkon Milkon	modifie	mated f	y % vo	ituriie in	stead of % w	relaht	Procedure No. RM	
	:	(2)	Sone b	(oaks c	annoi bo	match	iotage i id, acci	measur urate fo	stead of % w	romo	la.	Revision 0 Rective: 12/31/98
1410	0154-13	lly form	GT.LANO	NO1-423								Page 27 of 28

	ROCI	KYFI	ATS	ENVI	RON	MEN	TAR .			FORM PRO.101A
6)ale: _ icolog	3/1/ lst: A	mber: oth: 50 - Pach - Pov	nen/3)	- 0 Ist: <u>s</u> 2:	39 urvey Tug	<u>a</u>	DLOC	FORM PRO.101A GY SITE BORIEHOLE LOG PAGE 20F 2 Surface Elevation: Surveyed Area: 903 Pad Total Depth: Company: URS
			GING				-		. !	Sample Type: Dull Tube Project No.: GR 210)
A	PPR(DVAL		SUPE	KÅ120	OR	'			
8	B	, Ke	E		7	1 - 1	_		-	DATE
8	2	CET OF STREET	10.0	P S S S S S S S S S S S S S S S S S S S	FOO.	STANDERS OF STREET	200	PER P	200 S	SAMPLE DESCRIPTION
			A			-	 	10	5	CONTRACT OF SCHIPTION
		'					GC		/	
	 .			2		•		•	4	
			1					-11-		-10.9-12.5 Clay
							CL	- 4		1+ brownish gray 2.5 + 6/2, St. Ff, slightly moist, W/ Source college to the state, Subround, fine
÷	45.0		12.0	1		I		_, _		Stiff, slightly moist
	(s.0	罚	12.5	I	1			. 2	//	Show to capitalisments to
		3.6		- 1	.	1		· 7		I
				1	:	K	sch	-13-		212.5-16.6. Cleyey gravel 25 yr 5/8, coarse poorly graded, Subsound, dry.
	i	4.0			. [.	-	. 4	//	75 va strong brown
1] -		- 1	L	_ 121	* /	grades 18) coarse poorly
1			.	1				- 14-7		. Subsound, dry
	ı	.			I		F			
		ď				- 1	-	-15-1	7	and the second s
ŀ		- [.		- 1				/		
1			16.0	- -		1	- 1			
ľ	6.0		D	-	-			16-1/		
	- 1	1	66	. :		-	十	-/_		
	3	.5	7.1		-	-1	-	7-1/	// /	66 - 19.5 Clay dive
	1	40		- [-	1		L		Λ :	pellow 2.5 y 618 mother
				ŀ			-[7/		yellow 2.54 6/8 mother with gray 2.54 6/1
	- .		- 1				一	18-1/		very stiff, slightly moist. [WEATHERED BEDROCK]
			- 1	1		1.	·F	4//		MOIST. [WEATHERED BEDROOF
ľ								m_\$/		
	1].	1			1	1	'' [']		
				1	1	∇	才.	- K	41	9.5-20.0 TD NORECOVERY
ES:	Gene	rat IK	CS is n	سياس	حائث موجود	٢.	7	go kî	7	. To we were
									sualak	Procedure No. RMRS/OPS-PRO.101
	(2) 0	ous pús ámil bu	aks can oxen co	re, lacci not be	urate fo match	otage i	MORSUI	islead of % rements no	i possit	ble. ACVISION U
1144	dellar C	DLOKALT				-,		weda una	SUPPRIOR	onts not possible. Date effective: 12/31/98 Page 27 of 28

Groundwater IM/IRA - 903 Pad VOC Investigation

Area 5 Borehole Logs

Date effective: 12/31/98 Page 27 of 28



Lo Da Ge	cationate: _	n - No 3/3/0 st _A	nber. rth: <u>&w</u>	wyed	Ea	, ,			•	SY SITE BOREHOLE LOG PAGE OF Surface Elevation: Surveyed Area: 903 Pad Total Depth: 201 Company: UKS Project No.: Sample Type: Dual Tube
•		LOG(DVAL	SING S	SUPE	RVIS	OR	, ·		· .	DATE
OF COME	TOPROTTOM	PEET OF CORE IN BYTERON.	BAMPLE	FRACTURE	PEDOING	GRANN BIZE DISTANSUTION	USCS STABOL	OEPTH IN	LITHOLOGIC	
.0	1.0	Age of the second	2.4 Byon 4.0 Cyon	nP 3.34≤			GC GC	- 1 - 2 3 4 5 1		0-0.4 Sand-silt-clay mixture inth gram [Fill] dark reddish brown 6483/2, poorly graded 0.4. clay-soft, grave quantity gransh c(0.1) Clayer Sandy Gravef yellowish red 5485/6 to reddish brown gravel-subang grantzite 5485/3 (0.1 in) poorly graded Sand-subrandod, medcoarse quantz -slightly moist 4-1.5. 518094 Acp 3-3-057 40-6.4 Clayer Sardy Gravel as above befores
O 8		2.4		2 / 2		/		-6	\bigvee	6.4-8.0 No Recovery 8.0-12.0 Clayar Sandy Gravel as above

(4011-430-0134-930); Form GT_LAX030L423

(1) Badly broken core, accurate tootage measurements not possible.

(2) Core breaks cannot be matched, accurate footage measurements not possible.



Borehole I Location - Date: 33 Geologist: Drilling Equ	lumber: North: <u>Sw</u> os A Pach	rveyse	Eas	ج.				Surface Elevation: _surveyed Area: _903 Pad Total Depth: _Zo.o' Project No.: Sample Type:
RMRS LC		SUPER	RVISO	OR ·				DATE
TOPROTTON OF COPE INSOX TOPROTTON OF UNTERVAL	MEASUMENT SAMPLE NAMBER	FRACTURE	BEDDING	DISTRECTION	USCS STABOL	DEPTH IN	LITHOLOGIC	
12.0 12.0 4.c					GC			12.0 'Clayey Sandy Gravel see previous page 7.9-18-1 Sandy Clay with Gravel see previous page 8.1-19.2 Gravely 10'6 more play 8.1-19.2 Gravely (lay with sand 5% loss sand, 5% note Gravel 1.20.0 Silty Sandston- dark reddshigray syr 4/2 moderathy stone, completely weathered
20.0 4.0 NOTES: Genera	19.7					20 ::	20	moderately string, completely wenthered

(2) Core breaks cannot be matched, accurate footage measurements not possible. [401]-930-0134-930X Form GT_LAX03/01-923

(1) Badly broken core, accurate footage measurements not possible.

Date effective: 12/31/98

Geol Drilli	ntion - : 3 logist ng Eq	Not 9/ 2 uip.	th: <u>74</u> 05 Tu: Ams	9247.9 TA	L_Ea	OBE 9	3579	2 	.:	Surface Elevation: Survey Area: 100-11 (103 Pad) Total Depth: Company: URS Project No.: 6R 21011 Sample Type: 1MK DUAL TUBE					
•	PROV			SUFEI	KA19(OK .		· .	DATE						
OF CORE INSOX	DITERVAL:	IN STEED VA	SAMPLE	FACTURE	PEDDING	GRAIN BIZE DISTRECTION	USCS	DEPTH IN	LITHOLOGIC						
4	0 2.	2.8 / 4.0	3.5 A 4.5 B			6	3	-		Very dark grayish brown 1048 Fine-coarse, well-graded Subround, quartz, slightly Moist [FILL] C4.8" smol stuck in rod; lost. Offset IFT south & resample 119ht brown 4.5 4R 6/3 exitte coarse, poorly graded, subron-d, quartzitz lry with greenish gray south CLEYI 4/1 sand, fine, From 6.2-6.5 ft					
8.4	40/41	0/0	6.0				\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	9-1		8.0-10.5 Sa-Dy grant 95 above 35-8.0					

NOTES: General: USCS is modified for this log as follows: P

Materials amounts are estimated by % volume instead of % weight

(1) Badly bridgerroove, accurate (botage intersurantents not possible)

(2) Core or take calinot be matched; accurate footage measurantents not possible.

Procedure No. RMRS/OPS-PRO 101 Revision 0

Date effective: 12/31/98 Page 27 of 28

12/	
ا الله	\
	ر

•	Lo Da Ge	oreholocation ate: eologi	le Nun 1 - Nor 3/9/0 st: _Z	nber: th: <u>74</u> 55	9247.4	Eas	1: <u>29</u>	8579		, ·	SY SITE BOREHOLE LOG PAGE 2.0F. Surface Elevation: Survey Area: 100-11 (103 Pad) Total Depth: Company: URS Project No.: GR 210100
	RI	MRS			SUPER				<u> </u>	~	Sample Type: Mix Duke Tuke DATE
	TOPPOOTOM OF CORE	TOF/BOTTOM OF	IN MILE SOME	SAMPLE SAMPLE	FRACTURE	PEDDING ANGLE	GRAIN SIZE DISTRBUTION	SYMBOL	DEPTH IN	SOIL	SAMPLE DESCRIPTION
		(2.0		C 10.5 D 11.60				SC	-/0 -/1- -/2- -/3- -/4- -/6- -/8-		15.2 - 16.0 Sady moders, poorly graded, following subangular, poorly graded, follopart sta, slightly moist. 15.2 - 16.0 A Clay, light gray 54.7/1 method with drie rellow 25.4 6/8 stiff, slightly moist, fing subraind sand EWEATHERED BEDROCKI
は、世界というないのでは、			neral I						-19- -		

General: USCS is modified for this log as follows:

Materials amounts are estimated by % volume instead of % weight.

(1) Badly bytoken core, sacturate bottage measurements not possible.

(2) Core britishs cannot be matched accurate too tage measurements not possible.

Revision 0

Date effective: 12/31/98 Page 27 of 28

Area 5



Page 27 of 28

	IRS L PRO		ING S	SUPE	RVIS	OR				Sample Type: _dual tube
OF COM	HOTOPOTOM OF SIGENAL	MANTERAL PREID	2 Kara	FINCTIVE	POP	CAMPACTE DETRECTOR	USCS SYMBOL	* 155	Son. LineLook	SAMPLE DESCRIPTION
	.0 4		Avoc Brok Brok Bvoc Cvoc	3,200 3,200			GC			0-0.9 Sand-sitt-clay mixture with graph redusts brown SYR 4/3, coarse-med. sand, [Fill] 0.9- Clayey Gravel with trace sand pinkishgray SYR 6/2 gravel-quartzito, subangular (0.1in) poorly-graded dk gray STR 4/1 shightly moist granitic/quartz sand <57. dark reddish brown 2.54R 3/4 subrounded, med. Clayey Gravel as a Love

R	OCK	Y FI	ATS	ENVI	ROM	MEN	TAT '		-	FORM PRO.101
Bo	rehol catio	e Nu	mber:	CQE	37-02	36	- ~ .	FCHNOI	LOG	Y SITE BOREHOLE LOG PAGE 20 Surface Elevertion: Surface Elevertion:
Da	ue:	<u>3-2-</u>	25		E	ıst:	surve	yed.		Surface Elevation: Surveyed Area: 908 Pad
Ge	rologi	st:	A. Pack	eco	_			——————————————————————————————————————	:	Total Depth: 22.01
Dri	lling E	quip.	: _Po	verla	be				;	Company: URS
RN	/RS	OGG	GING	SUPE	20/10				<u>.</u>	Sample Type: _dual trube Project No.:
AP	PRC	VAL	JIII G	SUPE	KA120	OR			:	
-	1.		EI						-	DATE
5 % B	Ĕ. š	889	35	18-	9	HŽ			استندا ن	
68	20 5	OFE		PACTURE A BOLE	8 4	OMMINES OF THE STATE OF THE STA	2 2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	18 8 8	•
-	2 -	23		-		8 8	132	8.	62	SAMPLE DESCRIPTION
		ŀ					GC	 	7	
- 1				l i			١٣٥	I. Y	4	Clayey Gravel as above with traces and
		l		1 1				$\Gamma \cdot \not\vdash$		with traces and
- 1	•	1	II.I Dvoc	1 1				- //- /	1	
- 1			11.2	1 1					<i>Z.</i>	·
, .]		,, .	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		-			⊢ - / /	7.4	
2.0	20	7:0	1	l	ı	ı		\ \ \{\/	1./	
- 1	- 1		12.3		ı	1		-12-		
. 1	- 1		E va		- 1	- 1	- !		1	12.3 PID=0.3ppm, Fe-Dx Staining
- 1	- 1		125	- 1	.	j	ı	7/	۱/	red 2.54R4/6
5/	ا۔ ہ	ار،		l	. [- 1	}	-13-/	/	Coarse sand, subrounded
:2 /	35	1.5		- 1	.	ĺ			Z	slightly maist
				1	.	. 1	ŀ	- イク	<i>7</i>]	Offsets due to refusal.
	- [[1	-	. 1	1	L	-14-1	7.	To the total and
	- 1	J	.]				ſ	~~~~ <u>~</u>		•
- [- 1	- 1		j	- 1	- 1	-	イン		
	ı	ı		ł	- 1	- 1	J	7		Cha Gan
ı	j		I			ŀ		-15-16	7	Clayey Gracel as abovo
		- 1	- 1		- 1	- 1	L		1	
) 16	.02	ا ک	- 1	- -	- 1	ł	Ì	4	1	
-			.		ı	ト	7	-16-12	Ju	6-6-16.5 No Recovery
T	-	- 1		- 1	- [\times	X		
1			ł	- 1:		G	c	17/1	716	S-17.0 Clayey Gravel as above
	1	- 1	- 1	- 1	- 1		<u>/</u> _	-17-1/2	7	grading into posses
1	-	- 1		- 1	- 1	1			//7.	0-18.7 Gravelly Con
	1		- [Ī		10	-	-\//	4	orading into pos-2-05 0-18.7 Gravelly thay Sandy Clay gravel-0.02 to 0.1 in , subargular quartite
1	- 1	- I r	8.2			ı			/	Said-coarse to medium, subsorned, grantz
1	1	Ŧ	voc	1 .	1	ł		· /8 — ///	4	clay-stiff, slightly moist
1			.7	1	- 1	- 1	L		7	well-anaded
1	-	G	be	ı				177	12	3.7-20.0 Silty Sandstone with trace grave
1	1	L		ŀ		- 1		17_]	have 3 200 d
1	-	17.	.2		- 1			1111	1	brown 251RS/3 to yellowsh brown love 5/4
I			-	- .			-	-1111	1	Mad-Strang
20.	0 3.9	1						20	1	Shightly noist phe/subrounded quantz
TES:	Gener	at US	SCS is r	nodified	l for the	la lon -	e dollar		ļ	
	tarte NO1	wars and	nounits :	278 BSTY	malani	Mar 44. 14	4		velah.	Procedure No. RMRS/OPS-PRO.101
			THE PARTY OF	iini oo	maich	90, a cc	urate f	oorage measi	ur o m	ents not possible. Date effective: 12/31/98
O(P-M 10-										Page 27 of 28

Ge	ne: ologi:	it: A.	Pache	10	_Ea				:	Surface Elevation: _Surveyed Area: _903 Pad Total Depth: _22.0' Company: UKS Project No.: Sample Type: _dual_hbe
RA AP	ARS I	LOGG VAL	ING :	SUPE	RVIS	OR			-	
0 COM	TOPROTTON O SO STEPNA	MATERIAL PROPERTY AL	70.0	FRCTURE	Second Month	GPARTED OFFICE OFFI	STATE	oeth a	E SOL	SAMPLE DESCRIPTION
220	22.0	20	20.2					- 2		20.0-20.2 Coarse Sand subangular, quantz, Moist PID=1ppm 20.2-22.0 Silty Sandstone brown 7.54R 5/3 to yellowish brown to grayish brown 104R 5/4 mod-strong 104R 5/2 fine subrovinded quantz sand TD=22' computely weathered
								-25-		
								-u- -u-		
								-28-		

R	OCK	Y FI	ATS	NVII	047		-		-	FORM PRO.101A
В	oreho	le Nur	nber	(021	1-09/	1EN1	ALT	ECHNO	LOG	Y SITE BOREHOLE LOG PAGE / OF 3
L	ocatio	n · No	nh: <u>Su</u>	rveucd	<u> </u>		15.00			Surace Elevation: Surveyed
1 0	ate	2:27	25			ot, <u></u>	m vege	<u> </u>	*	Nea:903 Pad
G	eolog	ist: 🚣	.Pach	10					:	Total Depth: 22.0'
D	rilling	Equip.	: Po	werpr	OPÉ				i	Company: URS Project No.:
R	MRS	1.000	GING !	C1 (DE)		\ <u>``</u>	***			Sample Type: dust tube
		DVÁL		SUFE	K Å12(JK			:	
1	1	7771								DATE
įξų.	, jē	3 8 50		2	0/	MA		,	٠	
188	နှို့စ်			PROTO	ANGE.	Office STATES	200	1.50	280	
Ĭο.	Ď	F 52	31. y z	54	84	3 5	3 E	8.2	868	SAMPLE DESCRIPTION
	_	1	1	 			-		3	
1	1	1	1				GM		111	0-0.9 Sand-silt-clay mixture with gravel reddish byown syr 4/3, coarse-med. sand, [Fill]
1	1	1							111	September SYR 4/3, coarse-med, sand
1	1.		09	1					1.11	[Fill Tangundz,
1		1	PVOC		'		GC	┝╌┤╾┥	11.	
1	1	1	"	1 1						Clayey Gravel with trace sand
	1	1		1				- 4	49	. Pinkishgray SYR 6/2
ŀ	1	1			İ	• • •		_ , _	19	Clayey Gravel with trace sand pinkishgray 54R 6/2 gravel-quantzite, subangular (0.1in) poorly-graded dk gray 54R 4/1
1	1		20		ı				//	poorly-graded dkgraysyR4/,
1	1	1		Brox	- 1	- 1			19/1	shightly moist
l	1	1	200			- 1	į	ľ		
1	i	1	×		. [- 1	ŀ	-3-L	19	i
	ĺ	ŀ	Bvac	- 1		- 1	- 1			
.,	١.	١		l	- 1	- 1	ŀ	∤	//	granitic/quartz sand =5%.
4.0	4.0	1.6	l - 1	- 1		ı	.			dark reddish bown 254R 3/4
	ľ			ا م	Ė	į		— γ /	//	subsummed, med.
			38	3.20	1		L		1	· i
			4.9		1	- 1		7		i
			С	- 1		- 1	-	-5-1		
			VOC	- 1		- 1	- 1			·
				· [- 1	- 1	ŀ	/	19	·
- 1					•]					
						- 1	_ h	-6-1		I
- 1			1		1	Į	- 1	1		
	- 1	- 1		!		- 1.		٦,		
- 1	- 1			- 1		- 1	· L	/	7	
- 1	- 1	- 1	- 1	T.				77		
	I	- 1	i.	1	- 1.		-	. 4	/ /	· •
8.0	8.0	4.0	1		- 1			r,		·
,			- 1	1			-	- 8 ()		Clayey Gravel as above
			- 1	- 1	- 1		- 1			- wife diana as a love
	ļ	ı	- 1	- 1	ı			12	9	
	- 1		. [- 1		- 1	- 1	. 1/		
1		- 1		1.		·	十	-9 -1's		and the second of the second o
1	- 1	·	1	1	1		- 1	12	9	(
- 1	1			·			Γ	7/		i
	بـــــــــــــــــــــــــــــــــــــ							10	4	
NOTE	S: Ge	neral;	USCS is	modifi	ed for t	his log	as folk	ws:		Procedure No. RMRS/OPS-PRO.101
	Ma	alenais	amount :	2 are bs	timatet	bv %	wal ma	أبت الموجوعية و	% wek	
	T U	Denia	oroxen	COFE. IZK	CUIRIO	Sootan	a maa	Hiramadia i		sible. Date effective: 12/31/98 Pers 27 - 628
					· · · · · ·			wage m	- 45 UT 61	Page 27 of 28
									_	1260 2. 0120

Date effective: 12/31/98 Page 27 of 28

F	OCK	Y FL	ATS	ENVI	RON	ALE: NO				FORM PRO.101A
В	areho	le Nu	mber:	CQE	37-08	36	I AL	TECHNO)rb(GY SITE BOREHOLE LOG PAGE 2 OF 3
	OCETIO	n - No	rth:s	urvate	Z_Ea	st:	urve	yed	•	Surface Elevation: Surveyed Area: 903 Par
	ait, _	<u> </u>	A.Pac							Total Depth: 22.0
lö	rilling	Equip	: P	ree Pa	be				:	Company: URS
		-					-		:	Sample Type: _duel tube
R	MRS	LOG	GING	SUPE	RVIS (OR			:	
LA	PPR(DVAL							!	DATE
8	3	- XZ	\$		T	1 8	İ	7	7	DATE
28	28		취 호텔	MCTURA AGUE	NO.	3 6	2087	25	1 × 8.	
189	ě	FEE	죕 3 3	1 \$ 2	₽ ₹	GRAN SU DSTREET	3 2	5.5	200	SAMPLE DESCRIPTION
-	╅	+	₹	- 	 	_ B	<u> </u>		5	
1	1	1	1	1	1	ŀ	60	.	VZI	Clayer Grand as al
	1		1	1			ı	-	1//	Clayey Grand as above with traces and
1	1.	1	11.1	1	1		1		1/6/	
1		1	Dyoc	1			I	- // -	//	
	1	1.	11.2	7					11/	.)
12.0	120	4.0		} ;		i	ŀ	Γ	Vi.	
-	120	11.0	+	1 1				-/2-	//	
1	l	l	12.3	1 1	1 1			'-	/./	122 4
ł		1	E VA	4 1				F 4	//	12.3 PID=0.3ppm, Fe-Dx Staining
l		1	125	1 1	·				4/	1 1 2.54R 4/6 V
13.5	12 <	1.5	I	1 1	.	- 1		13-1	///	Coarse sand, subrounded
1	150	1,3	1	1 1	· [- 1			1/1	slighth maist
				1 1		1		7	//	Offset s' due to refusal.
			1	!!				14-1	1/1	
]	1 1	- 1	- 1		''	//	•
				1 1	- 1	- 1		├ -	Z	
				1	1				/	Clayey Gracel as above
					- 1			15-	1	Clayed Clase as above
i	-				- 1	- 1			41	
60	16.0	2.		1	.			· 7	61	
-	-	احت		[ſ	ŀ		-16-	\angle	16.5 No Recovery
- 4		1		1	.		\times I	T	ΧI	
- 1	- 1						, c			16.5-17.0
- 1	ł	ľ	Ì	· 1		19	~/			Clayey Gravel as a bove
- 1		- 1	. 1	.	1		1	-"-	7//	grading into porcos 17.0-18.7 Gravelly clay Sandy Clay
. [- 1	1	1		- 1	r	CL	!/	///	acoust a control and chy
	- 1			}	j		-[//	gravel - 0.02 to 0.1 in , subargular quarteite
	- 1	- 1	18.5		[- 1	ŀ	— 18 — [/	//	same-course to medium, subrounded, quantz
	- 1		Froc	- }						clay-stiff, slightly noist
	1		18.7	1		L	┵	[/	11	well-graded
- 1	.	- 1	Gvac		1			1	111	18.7-20.0 Silty Sandstone with trace grave
1		- +					ŀ	-/7 []	411	brown 254R5/3 to yellowish brown 104R5/4
	- 1	ľ	7.2			- 1		13		
20.0	, , ,	ا ر ر		1.	- 1	1	1	· 7:1	4]]	
				باب				20 :		Shightly moist completely weathered
NOTE	S: Ge	nerat (USCS	s modifi	ed for p	his log	as fol	lows:		Persodure No. BAADCODO DOC 101
	Ma	iterials	amoun	is are pr	stimatet	1 by %	volum	e instead of	% wel	ght. Revision 0

(2) Core breaks cannot be matched, accurate tootage measurements not possible.

F	оск	Y FL	ATS E	NVIE	OKA	CE NITT		-		FORM PRO.101A
L	ocation	- Nort	th: Su	CQ37	-086 €a	st: Sy	INEY E	ECHNO		Y SITE BOREHOLE LOG PAGE 3 of 3 Surface Elevation: Swiveyed
1 0	ate;	3-00	Pache		+			-		Area: 903 Pad Total Depth: 22.0
0	ritting E	quip.:		e Prot	пе				•	Company: VRS Project No.:
	MRS ! PPRC		ING !	SUPE	RVIS	OR				
1	12	W. 5	1	T	T	-	_			DATE
TOWOT OF COM	9	REST OF CO.	20.0	FRACTUR	- BEDOM	DETABLISHED	2020 2020 2020 2020 2020 2020 2020 202	oerth se	SOIL LINGUOGE JIGE	
	1	1	20.2	1			}		:::::	20.0-20.2 Coarse Sand
l	1			{		1	l	├ - -		Enbargular, quantz, moist PID= 1 ppm
	1.	1		1			l	-21-	:	brown 7.54 x 5/3 to yellanish brown
		1							:	mod-strong loves/2 loves/4
22	220	20								fine subrounded quartz saind
			1				-	-22-		TD=22' completely weathered
	1				,					•
	1							_28		•
		ĺ					·	-25-	:	
	1							ト - 니		
	1							-24		
	1							27		
		-				1		ㅏ ㅓ		}
				1	- 1	- 1		_25		"
				- 1	- 1	- 1			٠ }	
				1		l			.	·
					.]	٠.		— 26— <u> </u>	:	
			. {	- {	. [- 1				
				1				_22_	•	
			.]	- 1	- }			-		1
		.	1	Į.	.				1	:
		į	1	1	. [1	- }	-28-	: }	
			1	1	1	1	!]	:	
•		. }	1	1	1			7		
			1	ŀ			. }	-29-		
			1	1	1	1	-[.]	: [
								30		
NOT	M (1	aterials Badly	amoun	Core, 4	stimate sccurat	e foota	volun	Nows: ne instead o	hat an	Procedure No. RMRS/OPS-PRO.101 ight. Revision 0 eable. Date effective: 12/31/98 ements not possible. Page 27 of 28

R	OCK	YFL	ATS	NVII	302	ATTE NAME	PAF -			- OKM PRO.101A	
Во	rehol	le Nu	nber:	CQ37	1-087.	TEN:	ALT	TECHNO	LOG	Y SITE BOREHOLE LOG PAGE 1 OF 2	
Lo	cation	1 - No	nth: _5	arreye	<u></u> LEa	st:	8urve	ned		Surface Elevation: Surveyed Area: 903 Pad	
Ge	ite: ologi	st:	1 Pad	1010	-				:	Total Depth: 20/	
Dri	lling	Equip.	: Pm	2 Pro	be.				÷	Company: URS Project No.	
DA	ADS.	1.00	GING :	CLIDE	2170				- 	Sample Type: _Duce Tube	
AP	PRC	JVÁI	JING	SUPE	K Å12(ЭK			;		
-··	APPROVAL DATE										
688	Ĕ	1889	3 75	135	27	äğ	. 5	1	8		
TOPPO TOP NO NO NO	000	P S		FRETUR	No.	OPPORTED DOTTER OTTO	200	£.5	1995 1990 1990 1990	SAMPLE DESCRIPTION	
-	-	25	¥	ļ	ļ.	- B		· ·	5	The state of the s	
}	1	1	0.3		1		GM		111	CFINT dalk coddict to mixture with gravel	
		ł	A	1	1	l	GC	 - -		[Fill] dalk reddish brownsyR 3/2 0.3 - Poorhy-grandel slaberty a sixt	
		1	YOU	1		ł	Jac		1/1	1	
		}	EPA.	}].			' -		Clayey Granel H gray 101R7/2	
		1	EVA		1				//	poorly-graded, quantzite -subangular cby-soft, slightly moist (0.1 in)	
1		1	sphil							cby-soft, shahtymoist (0.1 in)	
			2.3					-2-	1	J , J J ,	
li		1	6								
1 }		l	VOZ						6/	ı.	
		1	EPA					-3-	1		
		ľ	spl	1	1						
4.0	4.0	4.0	`		: 1				1//		
7-0	1.0	7.0	4.3.	1	· 1	Í		 4		·	
		ĺ	c l	}	1	- 1	I	_ ` }	1/	•	
			you	. 1	- {	- 1		_ 7		1	
ľ	i		EPA	- 1	- 1	ı	ŀ	-5-1		· 1	
·			split	- 1	- 1	- 1	į			i	
			,	.	. 1	ı		- 7	1/9	1	
. }	•		6.0	- 1	- 1	- 1	.	-6-K		1	
	- 1		1	- 1	٠	- 1					
- 1				. [:	i	ı	_Y			
	J			- 1	.	- 1	Į.	-7-L	//\	·	
	1	.]		- 1	- 1	- 1	- 1			·	
_			1	- [t	{/	1/1		
3.0 8	0.	4.0	.		1		L	_ 8/			
	-	1		- 1	·	- 1	1	٥	1/		
		Í	.	. j			. · }	1/			
- 1	1		1	1.	}	1	1	a V		i •	
	- }.			- [- 1	1	Γ	-4-7	//	· · · .	
	- 1	}	1	- 1	- 1	- 1	L	. 4%	/.1	. 1	
	- 1	.]	}	}	- 1	- 1		10		• 1	
NOTES	·		USCS I	<u>-</u>	maile.						
		10161	I	· woot	101	MILE 100	83 foll	OWS:	; .	Procedure No. RMRS/OPS-PRO.101	

Revision 0

Date effective: 12/31/98

Materials amounts are betimated by % volume instead of % weight.

(1) Badly broken core, accurate tootage measurements not possible.

(2) Core breaks cannot be matched, accurate tootage measurements not possible.

	~~~	V tot	A TOO TO	-			-		<del></del>	FURM PRO.101A
Lo.	cation te:	- Nor	th: _5	ancy	-087 	TENT	ALT	ECHNO red		Y SITE BOREHOLE LOG PAGE 1 OF 2 Surface Elevation: Surveyed Area: 90,3 Pad Total Depth: 20'
Dri	ologi: Iting E	quip.	Pach Part	eco APOL	e.				; (	Company: URS Project No.:
		LOGO	ING S	SUPE	RVISC	OR				
1	2	22				1 . 1			<del></del>	DATE
POSON POSON POSON	TO S	WANTERSON CO.	Turns.	Frection	PROPE :	DAMMENT DATEMENTO	100 m	# 1250 # 1250	2007	SAMPLE DESCRIPTION
			0.3 A	-			GC			[Fill] dark reddish brown SYR 3 12 0.3 - poorly-graddishighty noist
			VOC				GC	_ 1_		Clayey Granel
			EPA						//	H GCON 1000 714
		1	2.3							poorly-graded, quartzite -subangular cby-soft, slightly noist (0.1 in)
				·					1/	
			vor						6/	
			EPA					-3-	//	
,	ď "	٠, ٠	spht						1/	
40	4.0	4.0	4.3.					-4-		
			C						1/2	
			EPA				1	-5-		
			split	l	-	4 -		- 4		
			6.0	.				-6-		
				İ				_ ]	//	
.				l		1	į	_ 7 _		
		:					.	_ , _ ]		
8.0	8.0	4.0		}	1			7	1/9	· .
								-8-		
						[	.		1/1	
					.		•	-9 <del>-</del>	//	
							+		//	1
NOTE			11800	بلب	ified for			10 1	61	
	M	aterials	amour	its are	stimate	ed by 9	volun	e instead o	% we	Procedure No. RMRS/OPS-PRO.101 Ight Revision 0
	(2	Z) Core	breaks	canno)	be mai	v 10018 Iched,	eccnus	surements te footage n	not po ripasun	oments not possible. Date effective: 12/31/98 Page 27 of 28
							_		-	1 agc 21 01 20

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BOREHOLE LOG PAGE _ OR OF CONTROL CONTROL NORTH _ DANGE _ CONTROL E SITE _ DANGE _ CONTROL	ROCKY FLATS	ENVIRONMEN			FORM PRO.101A
RMRS LOGGING SUPERVISOR  APPROVAL  DATE  SAMPLE DESCRIPTION  SAMPLE DESCRIPTION  SAMPLE DESCRIPTION  SAMPLE DESCRIPTION  SAMPLE DESCRIPTION  SAMPLE DESCRIPTION  GC  GC  GC  GC  GC  GC  GC  GC  GC  G	Date: 3-2-05 Geologist: A Pack	vero	Burrened	Area: 903 Pad Total Depth: 20' Company: VRS	
APPROVAL  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STATE  BY STA		THE PERSON NAMED IN COLUMN TWO		Sample Type: Dud Tabe	Project No.:
GM	APPROVAL	SOPERVISOR	,	DATE	
GC - Clayer Grand Spirit Go. 3- Pooring-grand slighting and the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand of the grand	TONDOTTO PO CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDITION OF CONDIT	PACTURE ACCE.  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  MACAE  M	USCS STREED, STREED, CETT AN FEST AND LITHOLOGIC LOGGE	SAMPLE DE	SCRIPTION
5plit 6-0 -6-2 -7-2 -7-2	4.0 4.0 4.0 4.3 C voc			Clayen Gravel	Isighty Louis
	6.0		- 7 - 1 - 8 - 1 - 9 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		
Materials amounts are estimated by % volume instead of % weight.  (1) Badly broken core, faccurate footage measurements not possible.  (2) Core breaks cannot be matched, accurate footage measurements not possible.  Page 27 of 28	(1) Badly broken on (2) Core breaks car	are pstimated by % v	as follows: volume instead of % weigh	L	Revision 0 effective: 12/31/98

Born Loc Date Geo Drill	ehole stion - e: _3 plogisti	Numb North 2-0: Af puip.:	or. <u>C</u> Surv Sachec Por	Q37 Eyed o enpol	Eas	t: <u>su</u>			. A	SITE BORE urlace Elevation rea: 903 Proteil Depth: 20 ompany: VISS ample Type:	Survey		2 of 2
	IRS LA PROY		NG S	UPER	VISC	R		<del></del>		DATE _			· .
TOPHSOTTOM OF COME MINDOR	TOPROTTOM OF HOTERVAL	PEET OF COPE INTERVAL PRELID PRELID PRELIDENT	SAUPLE, MAIRER	FRACTURE	TOWY .	CIPALN BUTE DUST PRESUTION	USCS	refine refine	SOIL LITHORLOOK LOG		SAMPLE (	DESCRIPTIO	N
	16.0		17.3 Dvoc 17.8 Evoc	EPA TO EMPLY TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND TO LAND T			GL	-12- -13- -13- -14- -15- -16- -17- -19-		17. 2 - 17. 8 520 less G stiff, sligh 17. 6 - 20.0	Gravelly consulty sound, o.os. ity moist solly solly so	lay with si in subang fine, subrona undstrue	and  ulan grantzute led grantz sand
NO	TES:	Materia (1) Bac	als amo	unts ar	e jestim s. Jaccu	rated b	y % vo lotage i	follows: lume inster measureme urate foots	onts hat	weight. possible. surements not po		No. RMRS/	OPS-PRO.101 Revision 0 tive: 12/31/98 Page 27 of 28

## Appendix B

Contact Record for Completion of HRC Enhancements at the 903 Pad and Ryan's Pit areas

## ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time:

September 9, 2005

Site Contact(s):

Annette Primrose, Karen Wiemelt, Norma Castaneda

Phone:

303 994-2761

303 966-9883 303-966-4226

**Regulatory Contact:** 

Larry Kimmel

Carl Spreng

Harlen Ainscough

Phone:

303 312-6659

303 692-3358 303 692-3337

Agency:

**EPA** 

**CDPHE** 

**Purpose of Contact:** 

Completion of HRC Enhancements at the 903 Pad and Ryan's Pit areas

#### Discussion

As described in the Interim Measure/Interim Remedial Action for Groundwater at Rocky Flats Environmental Technology Site (GW IM/IRA)(DOE, 2005), amendments were to be added directly into the subsurface downgradient of the remedial action areas for the 903 Pad and Ryan's Pit area to enhance or improve the naturally occurring biodegradation of VOCs and enhance groundwater quality. Downgradient of the Ryan's Pit remedial action, the material was to be inserted into the subsurface through Geoprobe boreholes at an appropriate grid spacing to cover the area with the highest residual contaminant concentrations. Insertion of amendments at Ryan's Pit and the 903 Pad area was completed in accordance with the GW IM/IRA as described below.

## Ryan's Pit Area

Ten insertion points were placed within an area along the south wall of the previous source removal action at the south wall of the former Ryan's Pit excavation, where the highest residual contamination was present. Insertion of Hydrogen Release Compound (HRC)-X TM was initiated on June 20, 2005 and completed on July 6, 2005. HRC-X TM is an extended release form of HRC®, is made with a proprietary, environmentally safe, polylactate ester formulated for slow release of lactic acid upon hydration to biodegrade chlorinated solvents. The ten points were completed to a depth of 9 feet using a GeoprobeTM as shown on Figure 1 and a total of 510 pounds of HRC-XTM was inserted. The area was checked after material insertion, no subsidence was noted. Upon completion, the area was revegetated.

### 903 Pad Area

In the area of the 903 Pad remedial action, material was to be inserted into the subsurface in three arcs through the eastward draining paleochannel that is the primary groundwater flow path for this area. These arcs were located where there is the highest possibility of residual contamination and groundwater flow. This will enhance groundwater quality in this area by creating a reducing environment that will assist with the degradation of VOCs. The results of the investigation that determined the area of the highest residual contamination are presented separately.

Insertion of the amendment at the 903 Pad started on June 30, 2005 and was completed on August 12, 2005. A combined 5,710 pounds of HRC[®] and HRC-X[™] were placed into insertion points as shown in the attached figure (Figure 2). The insertion points were placed along a series of three arcs using either a rotary drill rig or a Geoprobe[™] along the major groundwater flow path

ER Contact Record 6/20/02

Rev. 1/17/05

5/51

through the 903 Pad area. Each hole was filled from bedrock or below to at least the bottom of the clean fill dirt brought in after the 903 Pad remedial action was completed. For insertion points where the rotary drill rig was used, a larger diameter hole was present. At these locations, the clean drill cuttings were mixed with HRC® and HRC-XTM during filling of the insertion points. The insertion points were all inspected after material insertion was completed. The material did not subside over time and no additional HRC® was inserted. After completion of material insertion, drilling equipment was demobilized and the area was revegetated.

#### Contact Record Prepared By: Annette Primrose Additional Distribution: Required Distribution: C. Dayton, K-H ESS D. Kruchek, CDPHE M. Aguilar, USEPA I. Paton, K-H ESS H. Ainscough, CDPHE S. Nesta, K-H RISS A. Primrose, K-H RISS J. Berardini, K-H M. Roy, DOE-RFPO B. Birk, DOE-RFPO L. Brooks, K-H ESS R. Schassburger, DOE-RFPO G. Carnival, K-H RISS S. Serreze, K-H RISS D. Shelton, K-H ESS N. Castaneda, DOE-RFPO C. Spreng, CDPHE C. Deck, K-H Legal S. Surovchak, DOE-RFPO N. Demos, SSOC J. Walstrom, K-H RISS S. Garcia, USEPA K. Wiemelt, K-H RISS S. Johnson, K-H ESS C. Zahm, K-H Legal M. Keating, K-H RISS

L. Kimmel, USEPA